4331

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY

DOE-FN/EPA

100
REPORT

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

Introduction

The Consent Agreement (CA) As Amended under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Sections 120 and 106(a), the Federal Facility Compliance Agreement (FFCA), and the Federal Facility Agreement for Control and Abatement of Radon-222 Emissions (FFA-CARE) between the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (U.S. EPA) signed September 20, 1991, July 18, 1986, and November 19, 1991, respectively, require that monthly reports be submitted to the U.S. EPA regarding progress made to meet the provisions of those agreements. This report fulfills those requirements by describing actions undertaken at the Fernald Environmental Management Project (FEMP) during the period March 1 through March 31, 1993, and planned actions for the period April 1 through April 30, 1993.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

WORK ASSIGNMENTS AND PROGRESS

Descriptions of work progress are presented in the following sections and/or enclosures to this report:

- o CA Section IX - Removal Actions.
- o CA Section X - Remedial Investigation/Feasibility Study.
- o Enclosure A - Wastewater Flows and Radionuclide Concentrations under CA Section XXIII.B.
- o Enclosure B - FFCA: Initial Remedial Measures and Other Open Actions.
- o Enclosure C - FFA: Control and Abatement of Radon-222 Emissions.
- o Enclosure D - Drilling/Boring Logs

CA Section IX. Removal Actions

This section provides an update of activities associated with the implementation of Removal Actions (RAs) at the FEMP during March 1993. Information is presented for each of the Removal Actions identified in the Consent Agreement As Amended.

Phase I Removal Actions

- o RA No. 1, Contaminated Water Under FEMP Buildings.
- o RA No. 2, Waste Pit Area Run-off Control.
- o RA No. 3, South Groundwater Contamination Plume.
- o RA No. 4, Silos 1 and 2.
- o RA No. 5, Decant Sump Tank.
- o RA No. 6, Waste Pit 6 Residues.
- o RA No. 7, Plant 1 Pad Continuing Release.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

Phase II Removal Actions

- RA No. 8, Inactive Flyash Pile Control.
- RA No. 9, Removal of Waste Inventories.
- RA No. 10, Active Flyash Pile Controls.
- RA No. 11, Pit 5 Experimental Treatment Facility.
- RA No. 12, Safe Shutdown.
- RA No. 13, Plant 1 Ore Silos.
- RA No. 14, Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator.
- RA No. 15, Scrap Metal Piles.
- RA No. 16, Collect Uncontrolled Production Area Runoff--Northeast.
- RA No. 17, Improved Storage of Soil and Debris.
- RA No. 18, Control Exposed Material in Pit 5.

Phase III Removal Actions

- RA No. 19, Plant 7 Dismantling.
- RA No. 20, Stabilization of UNH Inventories.
- RA No. 21, Expedited Silo 3.
- RA No. 22, Waste Pit Area Containment Improvement.
- RA No. 23, Inactive Flyash Pile.
- RA No. 24, Pilot Plant Sump.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

CA Section IX. Removal Actions (continued)

- RA No. 25, Nitric Acid Tank Car and Area.
- RA No. 26, Asbestos Removals (Asbestos Program).
- RA No. 27, Management of Contaminated Structures at the FEMP.
- RA No. 28, Stabilization of Thorium Nitrate
- RA No. 29, Contamination at the Fire Training Facility
- RA No. 30, Temporary Nitrate Storage Tanks

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 1, Contaminated Water Under FEMP Buildings

Plant 6 - Through March 1993 approximately 55,563 gallons of Plant 6 perched groundwater have been extracted and transported for treatment to the Plant 8 Volatile Organic Compound (VOC) treatment system. In addition to the original Plant 6 extraction system, the motor bay sumps are being added to the Plant 6 system. Until the permanent system is installed, water collected from the four motor bay sumps is being pumped to drums and then transferred to the Plant 8 VOC Treatment System. The design drawings are being revised to reflect the changes that resulted from the design review comments. Completion of Certified-for-Construction drawings and specifications is anticipated by March 31, 1993.

Plants 2/3 and Plant 8 - Through March 1993, approximately 134,204 gallons of perched water have been collected for treatment from Plant 2/3, and approximately 111,861 gallons of perched water have been collected for treatment from Plant 8.

Plant 9 - Approximately 22,808 gallons of Plant 9 perched water have been extracted and transported to Plant 8 through March 1993.

VOC Treatment System - Through March 1993, approximately 325,308 gallons of groundwater have been treated utilizing the Plant 8 treatment system. A reduced scope of sampling has been implemented so that increased pumping of Plant 2/3 can occur. This increased pumping is being coordinated with, and will occur when, the work to evaluate hydraulic pumping is implemented.

Pumping of perched water beneath the above-mentioned plants with subsequent treatment in the Interim Plant 8 VOC Treatment System, followed by uranium removal in the Plant 8 Wastewater Treatment System, will continue in accordance with the Work Plan provisions. Treatment will continue in this manner until the Advanced Waste Water Treatment (AWWT) Phases I and II are operational in 1994.

RA No. 2, Waste Pit Area Runoff Control

This removal action was completed on August 30, 1992.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 3, South Groundwater Contamination Plume

Part 1

The Work Plan for Part 1, Alternate Water Supply for two industrial users (Albright & Wilson Americas [AWA] and Delta Steel) was approved by the U.S. EPA on January 3, 1991. Subsequently, Delta Steel was deleted from the current scope of the project with approval of the U.S. EPA and Ohio EPA. The Delta Steel hookup will be delayed until the planned public water supply can service the facility. A revised Work Plan (Revision 1) was prepared and issued to the EPAs to reflect this and other changes which have occurred. A summary of the most recent and ongoing activities for Part 1 are listed below:

Construction and initial operability testing was completed in December 1992. However, the system will not be placed into operation until approval is received from the Ohio EPA. Results of additional sampling requested by the Ohio EPA were received on January 6, 1993. All data were within the expected limits except for the coliform analysis. As a result of a conversation with Ohio EPA, the wells were rechlorinated. Results of samples taken after rechlorination of the wells were negative for fecal coliform. Plan approval has been received from the Ohio EPA. This approval allows initiation of the 60-day acceptance period and associated sampling and analysis. Continuous pumping with associated sampling and analysis began March 25, 1993.

Part 2

This project was divided into five construction bid packages. These include: 2A - groundwater discharge pipeline (pressure flow) and outfall pipeline (gravity flow) from south of Willey Road to and including Manhole 183B; 2B1 - Manhole 183B to Great Miami River; 2B2 - Aeration Facility; 2C - recovery well field; and 2D - test well installation and pump test. The following is the status of the Part 2 activities:

Package 2A - Pipeline installation is progressing toward completion by April 30 to accommodate the Package 2D (Test Well) pump test.

Package 2B1 - Complete.

Package 2B2 - Construction of the Aeration Facility is progressing toward completion by May 14 to accommodate the pump test. Workarounds are planned so temporary operation can occur in the event that all items are not in place by then.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 3, South Groundwater Contamination Plume (continued)

Package 2B3 (Parshall Flume) - Notice-to-Proceed was issued to subcontractor the week of March 22, 1993. It is anticipated that only the flume structure will be in place by April 30, 1993, to accommodate the pump test.

Package 2C - The order of taking was approved by the U.S. District Court the week of March 15th. The State Archaeological Report to proceed with the recovery test well and partial well field construction was received the week of March 15, 1993. Archaeological survey of the Delta Steel property is scheduled to begin the week of April 5, 1993.

Construction of the Recovery Well Field (Package 2C) and Test Well (Package 2D) was initiated the week of March 22nd.

Part 3

The Work Plan for Parts 2 and 3 was prepared as one document. The plan entails the installation and operation of an Interim Advanced Wastewater Treatment (IAWWT) System to reduce uranium contaminant loading discharged to the Great Miami River to a level less than 1,700 pounds per year. Due to the relocation of the Part 2 well field to an area having a higher concentration of uranium, the IAWWT system capacity was expanded to maintain the 1,700 pound per year maximum level. The IAWWT system includes two treatment units. The IAWWT unit located at the Storm Water Retention Basin (IAWWT[SWRB]) consists of two trailer-mounted assemblies, each with a nominal 150 gpm capacity or a total nominal 300 gpm capacity. The unit located at the Biodenitrification Effluent Treatment System (IAWWT[BDN-ETS]) has a nominal capacity of 100 gpm. Current activities are described below.

<u>IAWWT(SWRB) Unit</u>

The IAWWT unit at the SWRB continues to operate successfully.

<u>IAWWT(BDN-ETS) Unit</u>

Design of a depth sand filtration system has been initiated along with a parallel effort to investigate biocide dosing to prevent biological fouling of the ion exchange vessels. The biocide dosing will begin in early April.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 3, South Groundwater Contamination Plume (continued)

Part 4

Part 4 of the South Groundwater Contamination Plume Removal Action Work Plan involves groundwater monitoring and institutional controls.

Private homeowner and existing RI/FS well sampling in the South Plume area continues. The two homeowner treatment systems installed south of the FEMP continue to operate successfully.

Part 5

Part 5 was added to the South Plume in order to address the relocation of the Part 2 well field. It includes groundwater modeling and geochemical investigation of the area south of the well field to determine if 20 ppb uranium concentration in groundwater is present downgradient of the Part 2 well field.

The South Plume Groundwater Modeling Report was revised to address the U.S. and Ohio EPA comments. The revised report is expected to be transmitted to the U.S. and Ohio EPA in early April.

The geochemical investigation is divided into four phases: Phase I - two traverse lines of hydropunch borings within the alluvium area and concurrent sampling of existing nearby wells; Phase II - two traverse lines of monitoring wells with corresponding hydropunch sampling north and south of the proposed recovery well field; Phase III - seven piezometers clustered near proposed extraction well R-4; and Phase IV - soil vapor sampling.

Phase I was completed on August 25, 1992. Only one hydropunch sample exceeded 20 ppb. A report summarizing Part 5 Phase I is undergoing review and is expected to be issued to U.S. EPA and Ohio EPA in early April.

Phase II, installation of the twelve wells, was started in late March. The six 2000-series wells will be completed and developed by May 14 to support the Part 2D Pump Test. Installation of several of the 3000-series wells may be delayed until after May 14 because of other demands for the drilling rigs. However, as these are secondary wells, they will not impact the test.

Phase III will begin shortly and is scheduled to be completed by May 14th to support the pump test.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 4, Silos 1 and 2

Installation of the bentonite in Silos 1 and 2 was completed on November 28, 1991.

The DOE submitted an evaluation detailing a revised method for determining the effectiveness of the bentonite in the silos to the U.S. EPA on December 17, 1992. A meeting between DOE and EPA was held on January 7, 1993. Disapproval with comments was received from the U.S. EPA on February 12, 1993. The U.S. EPA comments are currently being addressed. As discussed with EPA on April 13, 1993, information contained within into the revised Bentonite Effectiveness Evaluation document will be incorporated into the Removal Action Final Report.

As defined in the Removal Action Work Plan and the FFA-CARE, data associated with monitoring the effectiveness of the bentonite installation are included in Enclosure C.

RA No. 5, K-65 Decant Sump Tank

Removal of the liquid from the K-65 Decant Sump Tank was completed on April 16, 1991, when the liquid was transferred to the holding tanks in Plant 2/3. Treatment of the decant liquid based on the Material Evaluation Form and available analytical results was completed on May 12, 1992.

The tank has been accumulating liquid since it was emptied in 1991. Upon reaching approximately 80% of its capacity, repumping was required. On January 22, 1993, a maintenance action was initiated to pump the contents of the tank. On February 2, 1993, the action was completed with the removal of approximately 8,000 gallons of liquid from the tank. The liquid is presently awaiting the results of laboratory analysis, which will allow treatment and disposal of the liquid. On February 8, 1993, a measurement of the K-65 Decant Sump Tank was conducted. The results indicate that approximately three feet of sludge and liquid remains in the tank; this is approximately 500 gallons of liquid. Ongoing activities include monitoring the liquid level and implementing maintenance actions as required. Per requirements of the Work Plan, Operable Unit 4 will advise DOE-FN when pumping operations are to resume.

RA No. 6, Waste Pit 6 Residues

This removal action was completed on December 19, 1990.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 7, Plant 1 Pad Continuing Release

This removal action consists of three phases. Phase I, which implements the run-on/off control measures, is complete. Phase II addresses the installation of 80,000 square feet of a newly covered and controlled concrete storage pad. Phase III involves activities to upgrade the remaining 375,000 square feet of the existing Plant 1 storage pad. Phase III upgrading activities include installation of a polymeric vapor barrier over the existing concrete and the installation of concrete above the barrier with an epoxy sealant. In addition, 22,000 square feet of the Phase III work area will be enclosed beneath a tension structure.

Drum movements, which began in January 1993, continued and are due to be completed by May 14, 1993. The drum movements are required to clear areas for construction.

The specifications and drawings necessary for the bid package for Phase III activity are being revised due to an increase in the support capabilities of the pad. The revised Cost Estimate and drawings are due April 29. The Invitation for Bid for Phase III activity is expected in late May.

KEY MILESTONES	STATUS	DUE DATE
Complete Phase III	Open, on schedule	February 19, 1995

RA No. 8, Inactive Flyash Pile Control

The Inactive Flyash Pile Isolation Activity was completed ahead of schedule on December 23, 1991.

RA No. 9, Removal of Waste Inventories

During March 1993, 6,787 drum equivalents (DEs) of low-level waste (LLW) were dispositioned. The FY1993 shipment goal through March was 29,036 DEs. Currently, LLW shipping to the Nevada Test Site (NTS) is 1,667 DEs behind schedule. Repackaging material has reduced disposal volume shipped to the NTS by 2,821 DEs. The FY1993 goal is to dispose of 67,000 DEs of LLW at NTS and 50,000 DEs of LLW through subcontractors.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 9, Removal of Waste Inventories

Nevada Department of Environmental Protection has concurred with the FEMP characterization of thorium sampled in September. The analysis confirmed the process knowledge characterization of this waste stream. This closes the thorium disposal issues for the 1,624 drums of thorium from the Plant 8 silos and bins.

Disposition of residues to NTS through SEG and direct from the FEMP, and shipments of recoverable metal to SEG were initiated in March. The volume shipped to date are 114 DEs of residues and 242 DEs of non-ferrous metal.

KEY MILESTONES	STATUS	DUE DATE
Submit Annual Work Procedures for 1993	Open, on schedule	June 30, 1993

RA No. 10, Active Flyash Pile Controls

This removal action was completed on June 29, 1992. Any required maintenance will be conducted on an ongoing basis.

RA No. 11, Pit 5 Experimental Treatment Facility

RA No. 11 was completed on March 20, 1992.

RA No. 12, Safe Shutdown

The Safe Shutdown Removal Action documents the ongoing shutdown activities that will remove uranium and other process/raw materials from equipment and pipe lines in areas of formerly used processing equipment and will properly disposition the removed materials off site.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 12, Safe Shutdown (continued)

KEY MILESTONES	STATUS	DUE DATE
Submit Annual Work Procedures for 1993	Open, on schedule	June 30, 1993

The preliminary assessments of the major process areas are continuing. A thorough evaluation is being made of each plant, including the addition of air permit and compliance data. This information is being added to the preliminary assessment data base as it is made available. Field evaluation of Plant 8 preliminary assessment is in process.

Inventorying of expense equipment items continued; 2,878 expense items are currently in the data base; 1,411 have been field verified, 578 are on a "shopping list" to ascertain on-site use, 1042 have been transferred to Maintenance, and 110 have been placed on AC-563 Forms to be excessed. These numbers are expected to fluctuate from month to month as field verification is conducted.

The following is the status of capital equipment: of an estimated 1,694 total number of items, 1,195 have been put on AC-563 Forms to be excessed, and 499 have been identified as "In Use/Future Use" items. The number of items on AC-563 Forms and the "In Use/Future Use" listing may vary due to change of status of equipment items.

The status of Maintenance work orders issued to-date to isolate and disconnect all utilities/energy sources from equipment not in use is 421, of which 96 have been completed. Field verification of the completed orders is ongoing. Completion of these work orders is a preliminary step for removal of hold-up material from the equipment in preparation for equipment removal and decontamination and decommissioning.

Status of 4A Metal Removal Project, Phase II (shipment of rolled scrap to NTS): Representatives of the Department of the Army and a subcontractor assigned to negotiate the Army's contract with NTS, were on-site March 10 to update the project and to review the permit application to NTS. As a follow-up to that meeting, additional information was provided to them on March 19. While awaiting the finalization of their contract, the preliminary work has been expanded to include the placement of consolidated drums of depleted uranium rolled scrap inside the white metal boxes, as planned. The lids are then put in place and the four corners only are secured to allow for visual inspection To date, over 200 Nucfil vents have been installed and 44 white metal boxes. have been filled. Evaluation of the current Safety Assessment for this project resulted in concurrence that a revision was not required.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 12, Safe Shutdown (continued)

Several meetings have been held with Nuclear Systems Safety since September 16, 1992, on requirements for the Safe Shutdown Program field activities. An approved safety assessment was finalized in March. This will allow Safe Shutdown to gain entry and remove hold-up materials, and to remove radiological contamination. Exempt from the safety assessment are the Plant 1 storage area of enriched materials >2% U^{235} and Plants 2/3. These areas will be addressed by separate safety assessments. Having accomplished finalization of the safety assessment, the Risk Assessment and Risk Management Plan is expected to be approved during April.

Progress on the Requests for Proposals (RFP) for the sale of uranium continues to be delayed. Bids on RFP SD-417, for normal and enriched uranium, were due February 8. Three were received, two of which were two-company teams. However, due to potential conflict of interest with one of the bidding companies, Safe Shutdown was not allowed to open the bids. This has caused a slippage in the schedule of two months, thus far, and it is uncertain at this time who will finalize the selection process. DOE-OR Compliance Officer is reviewing the process to ascertain conflict of interest. Once their evaluation is complete, the present plan is that DOE-HQ will direct DOE-RL, who will then assign Westinghouse Hanford to complete the evaluation of the bids.

The due date for responses to RFP SD-416, for depleted uranium, is being extended to May 11, 1993, to allow time for several interested companies to test small quantities of the materials.

Planned activities for April include continuing packaging of the Army materials for off-site shipment, following the process on evaluating bids on SD-417 Request for Proposal for the Sale of Normal and Enriched Uranium; continuing to issue work orders for utility isolation work; continuing reconciliation of Safe Shutdown data base; pursuing completion of the Risk Assessment and Risk Management Plan; and commencing issuance of task orders to remove hold-up inventories from process equipment.

RA No. 13, Plant 1 Ore Silos

The Plant 1 Ore Silos Removal Action will include the dismantling of the 14 Plant 1 Ore silos and their support structure. This dismantling will eliminate the potential threat of additional material releases and the safety hazard due to structural deterioration of the silos and their support structure. The activities in this removal action will include characterization, removal, containerization, and disposal of the materials making up the above-ground portion of the facility.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 13, Plant 1 Ore Silos (continued)

March activities included removing the conveyors located between Plant 1 and the silos, removing and packaging transite, removing some steel decking and supports. FERMCO requested DOE concurrence to change portions of the work sequence to better facilitate the dismantling of the silos. The DOE gave verbal approval to change the sequence on some of the job elements.

April activities will include beginning the erection of the size reduction building, installation of cover over the UNH tanks, and removing ladders, conveyors, and platforms from the concrete silos.

KEY MILESTONES	STATUS	DUE DATE
Complete Removal Action	Open, ahead of schedule.	December 19, 1994

RA No. 14, Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator

This removal action will include the isolation or removal and disposition of contaminated soils in the vicinity of the Sewage Treatment Plant. This action will eliminate the potential threat of additional material releases to the environmental media through migration. The activities in this removal action will include characterization, removal, containerization, and storage/ disposal of the materials.

The revised Work Plan Addendum and comment-responses were submitted to the EPAs on March 29. Removal of contaminated soil per the revised WPA began March 1 north of the sewage treatment plant.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 14, Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator (continued)

KEY MILESTONES	STATUS	DUE DATE
Submit Revised Work Plan Addendum detailing need for further action based on analytical results	Completed, March 29, 1993	March 29, 1993
Phase III - Completion of off-property excavation	Open, on schedule	May 17, 1993
Phase IV - Submit Final Report	Open, on schedule for August 16, 1993	To Be Determined

RA No. 15, Scrap Metal Piles

The Scrap Metal Piles Removal Action will detail the stabilization and disposition of LLW scrap metal currently stockpiled on site. This removal action will minimize material releases to the environment. Approximately 1,300 tons of scrap copper along with approximately 3,000 tons of recoverable scrap metals are the focus of this removal action.

Containerization of the Phase I scrap metal pile at B69 pad began in February. A total of eleven containers have been filled to date; three have been shipped to Quadrex and eight are stored on site.

Containerization of the Phase IIA bulk scrap copper began on January 14 and was completed on March 12, 1993.

The pre-proposal meeting for the Phase IIB subcontract was held on March 18. The due date for bids is June 9, 1993.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 15, Scrap Metal Piles (continued)

KEY MILESTONES	STATUS	DUE DATE
Phase IIB: Submittal of Subcontractor's Removal Action Plan	Open, on schedule	September 30, 1993
Phase IIB: Submittal of Final Report	Open, on schedule	March 30, 1995

RA No. 16, Collect Uncontrolled Production Area Runoff -- Northeast

The scope of this removal action is to collect the remaining stormwater runoff from the perimeter of the 136 acre former production area that currently discharges to Paddy's Run and divert it through the existing storm sewer system to the Storm Water Retention Basin. Construction is ongoing along the north perimeter fence; 1,076 lineal feet of trench drain has been completed, and three tie-ins to the existing system have been made. 200 lineal feet of trench base has also been poured.

Future work on this removal action includes continuation of construction work.

KEY MILESTONES	STATUS	DUE DATE
Complete Removal Action	Open, on schedule	August 30, 1993

RA No. 17, Improved Storage of Soil and Debris

This removal action will include the management and appropriate storage of contaminated soil and debris on site. This will eliminate the potential threat of additional material releases to the environment due to wind, rain, or vehicular traffic. The activities in this Removal Action will include characterization, interim storage, and management of the contaminated soil and debris materials until the final remediation under Operable Unit 3.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 17, Improved Storage of Soil and Debris (continued)

The final Work Plan was submitted to DOE on February 18 for transmittal to the EPAs. A draft letter addendum for the Work Plan was submitted to DOE on March 31. This letter addendum will have DOE comments incorporated and will be submitted to the EPAs by April 16.

The subcontractor will begin borings for the survey after approval of the Geotechnical Survey Work Plan and Health and Safety Plan. The final Safety Assessment was submitted for approval on March 26; approval is expected in early April. Approval of the Risk Management Plan and the Risk Assessment Report is also expected in April. The 90% design package was issued for internal review on March 19; comments are due by April 15. Sampling of the Third Street Dirt Pile for RCRA characterization will begin and be completed in April.

RA No. 18, Control Exposed Material in Pit 5

Dredging activities were completed in December 1992.

There was no field construction activity during March. The training manual for the operation of the dredge was approved. Requisitions were written for top soil and sod to make the minor berm modifications.

Planned activities for April include adjusting the berm elevation to meet the free board distance requirements.

RA No. 19, Plant 7 Dismantling

The Plant 7 Dismantling Removal Action will include dismantling and dispositioning of the Plant 7 structure. This dismantling will eliminate the potential threat of additional material releases and the safety hazard due to histoplasmosis. The activities in this removal action will include characterization, removal, dismantling, containerization, and disposition and potentially beneficial re-use of the materials making up the above ground portion of the facility.

The Removal Action Work Plan (RAWP) was submitted to DOE on February 19, 1993. DOE comments were received on March 25. A meeting with DOE-FN and DOE-HQ was held on April 8 to discuss the revision of the RAWP to be submitted to the EPA on April 20.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 19, Plant 7 Dismantling (continued)

KEY MILESTONES	STATUS	DUE DATE
Submit Work Plan to the U.S. EPA	Open, on schedule	April 20, 1993

RA No. 20, Stabilization of UNH Inventories

The Stabilization of UNH Inventories Removal Action will remove and prepare for safe storage approximately 230,000 gallons of acidic UNH that is currently stored in 21 tanks in and around Plant 2/3. Existing processing equipment will be used to neutralize the solutions, filter the precipitate, and package the resulting filter cake in double containment for safe storage. This activity was previously part of RA No. 12, Safe Shutdown, but is being accelerated as a separate expedited response.

March activities included training of 100 personnel who are new to the UNH project, final approval of the UNH SOP, installation of new sightglasses on Tank F1-608, water testing of all process lines to ensure no leaks will be experienced when processing resumes, and DOE approval to resume processing.

April activities will include resumption of processing which is currently scheduled for April 12.

RA No. 21, Expedited Silo 3

On December 13, 1991, an Action Memorandum was issued to initiate an expedited removal action. The Silo 3 Removal Action mitigated the potential release of material to the environment and included the following actions:

- All obvious openings in the dust collector hopper were covered and sealed.
- The dust collector was removed.
- All obvious pathways for release were capped or covered.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 21, Expedited Silo 3 (continued)

Implementation of the Removal Action was initiated on December 20, 1991. The material within the dust collector hopper exposed to the environment was stabilized on December 21, 1991. Loose equipment on the silo dome was removed. Shipment of the sealand container, in which the dust collector was placed, to an approved disposal facility occurred on October 9, 1992.

On February 24, 1993, the Expedited Silo 3 Removal Action Final Report was submitted to the U.S. EPA.

RA No. 22, Waste Pit Area Containment Improvement

This project involves the stabilization of the south berm of Pit 4, the regrading of the drainage ditches along Pits 3, 4, 5, and 6, and the resurfacing of the road between Pits 3, 4, 5, and 6.

There was no field construction activity during March. A schedule and cost estimate were developed, followed by writing requisitions for materials, labor, and equipment to complete the removal action.

Planned activities for April are to mobilize to the field and start actual construction activities of Removal Action No. 22.

RA No. 23, Inactive Flyash Pile

A field investigation was conducted to determine if select locations within the Inactive Flyash Pile and South Field Disposal area boundary (RA No. 8) would require material to be removed. On June 24, contaminated debris from three of the regulated areas identified in the survey report were collected and placed in interim controlled storage. The contaminated items collected were a plastic bag (approximately 1 gallon) containing soil, a 1 foot x 2 feet section of transite and two small pieces of yellow material. Results of the survey were submitted on June 29, 1992. As a result of removal of the debris, DOE-FN determined that no additional action is required until remediation.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 24, Pilot Plant Sump

This sump is located on the southwest side of the Pilot Plant. The sump consists of a stainless steel cylinder approximately two feet in diameter and ten feet deep. This sump was built to remove liquids from the floor drains of the Pilot Plant and was actively used only during the renovation of the Pilot Plant in 1969. The sump is filled with a thick liquid and sludge. Analytical results of the sump contents show high concentrations of metals: lead, copper, chromium, nickel, as well as thorium and volatile organic compounds.

The sixth pump-out of the sump occurred on March 26, 1993, removing 150 gallons. To date, approximately 920 gallons have been removed. Preparations are underway to implement the removal, including the internal inspection of the sump drain line to assess its integrity.

April activities will include the submission of the Final Work Plan and analytical reports for samples of sump liquids taken so far.

RA No. 25, Nitric Acid Tank Car and Area

The Nitric Acid Rail Car is located on the northern perimeter of the production area and east of Building 63. The FEMP RCRA Part A and Part B application identify this tank car and area surrounding it as a Hazardous Waste Management Unit.

This high-grade, stainless steel tank car has a capacity of approximately 100,000 gallons and measures approximately 10 feet wide x 40 feet long x 15 feet high. This unit operated from 1952 until about 1989. The tank car stored nitric acid used at the FEMP. Based on recent analysis, the tank car now contains 50-100 gallons of nitric acid. This removal action includes removal of residual contents from the tank car followed by decontamination and dispositioning of the tank car.

The final Work Plan was submitted to the EPAs on January 28, 1993. Ohio EPA conditional approval was received on March 1 and U.S. EPA approval was received on March 8, 1993. The subcontractor prepared responses to EPA comments and revised affected pages to incorporate those comment-responses. A revised RAWP/CPID was submitted to the U.S. EPA and the Ohio EPA on April 16, 1993.

Also during March, requests for radiological and chemical sampling were initiated.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 26, Asbestos Removals (Asbestos Program)

This removal action documents ongoing asbestos abatement activity at the FEMP to mitigate the potential for contaminant release and migration. Abatements within the Asbestos Program to date include small-scale in-situ repairs, encasement, encapsulation, and removals.

The April 1993 Work Procedures submittal will include a model specification to apply to all asbestos abatement on-site (both small- and large-scale). This submittal will also provide generalizations of all abatement activities to date as well as planned abatement activities for the next year, including several large-scale abatement projects.

March activities included reviewing and updating procedures and the model specification in preparation for submittal of the Work Procedures. April activities will include receipt and resolution of DOE's comments and their incorporation into the Work Procedures for submittal to the EPA. Field activities in asbestos material identification and abatement continue.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Procedures for 1993 to the U.S. EPA	Open, on schedule	May 19, 1993
Submit draft Work Procedures for 1993 to the U.S. EPA	Open, on schedule	May 19, 1993
Submit final draft of Work Plan to U.S. EPA	Open, on schedule	August 10, 1993

RA No. 27, Management of Contaminated Structures at the FEMP

This removal action requires the submittal of the Engineering Evaluation/Cost Analysis (EE/CA) study to identify alternatives for managing contaminated structures; the documentation of the selection of a response(s) that will mitigate the potential threat to workers, the general public, and the environment associated with these structures; and addressing health and environmental impacts associated with the proposed action.

The final EE/CA will be submitted to the EPAs in April.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 27, Management of Contaminated Structures at the FEMP (continued)

The Responsiveness Summary was completed and issued in March. This document included comments from the public received at the EE/CA Workshop held January 12, 1993, EPA comments, and responses to those comments.

RA No. 28, Stabilization of Thorium Nitrate

This removal action has been incorporated into Removal Action No. 12, Safe Shutdown.

RA No. 29, Contamination at the Fire Training Facility

This removal action will address removal, decontamination and disposal, treatment or storage of all structures, tanks, equipment, the underground sump and oil/water separator, in addition to addressing "hot spots" soil staining, and any other surface soils from which a threat of migration of contamination exists.

The Removal Site Evaluation for this removal action was completed in July 1992. Soil vapor testing was completed March 12, 1993. April activities will include the submittal of the draft Work Plan to DOE.

KEY MILESTONES	STATUS	DUE DATE
Submit draft Work Plan to DOE	Open, on schedule	April 30, 1993
Submit draft Work Plan to EPA	Open, on schedule	June 30, 1993

RA No. 30, Temporary Nitrate Storage Tanks

This removal action involves the field actions to empty and thoroughly cleanse the interior of the tanks followed by disposition of the materials. The water will be characterized, transferred and treated through the exiting water treatment facilities. The sludges will be characterized, drummed, and dispositioned appropriately. The liners will be cleaned and decontaminated as required and free-released.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMOVAL ACTIONS

RA No. 30, Temporary Nitrate Storage Tanks (continued)

A draft Removal Site Evaluation was provided to the DOE on March 15, 1993. Development of the Removal Action Work Plan has been initiated.

KEY MILESTONES	STATUS	DUE DATE
Submit draft Work Plan to DOE	Open, on schedule	May 14, 1993
Submit draft Work Plan to EPA	Open, on schedule	July 15, 1993

RA No. 31, Sewage Treatment Plant Incinerator

This removal action involves the field activities to decontaminate and dismantle the incinerator and associated equipment. This work includes characterization and disposition of the wastes, containerization of equipment for shipment to NTS, removal and packaging of the transite for on-site storage, dismantling and monitoring of steel for free release, decontamination of removable contamination from the remaining slab, and decontamination of the work area.

A draft Removal Site Evaluation was provided to the DOE on March 15, 1993. Development of the Removal Action Work Plan has been initiated.

KEY MILESTONES	STATUS	DUE DATE
Submit draft Work Plan to DOE	Open, on schedule	May 28, 1993
Submit draft Work Plan to EPA	Open, on schedule	July 30, 1993

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

1.0 Operable Unit 1

Operable Unit 1, as defined in the Amended Consent Agreement, includes Waste Pits 1 - 6, Clearwell, Burn Pit, berms, liners, and soil within the operable unit boundary.

1.1 Field Investigation

1.1.1 Pits 5 and 6 and the Clearwell Sampling Program

Scope:

The objectives of the Pits 5 and 6 and Clearwell Sampling Program are to obtain sufficient quantities of samples for treatability studies, and to provide additional Resource Conservation and Recovery Act (RCRA) characterization information on the waste pits. The pits were sampled using a crane with a clamshell.

Status:

This project is now complete.

1.2 Treatability Studies

Scope:

The Operable Unit 1 treatability studies will evaluate the two treatment process options identified in the Operable Unit 1 Initial Screening of Alternatives document: cement stabilization and vitrification. The technical feasibility of these technologies will be evaluated by conducting a series of experiments on both composite waste samples and individual strata samples. Performance criteria, including formulation ranges, compressive strength, leachability, bulking factor, and permeability, will be investigated. Cement stabilization binding agents, including portland cement, flyash, Blast Furnace Slag, and sodium silicate, are being evaluated. Clay (attapulgite and clinoptilolite) will be added to reduce the leachability of metals in the waste. Glass formers and modifiers considered for vitrification are flyash, soil, and sodium hydroxide.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

1.2 Treatability Studies (continued)

The stabilization testing consists of two phases. The preliminary phase, now complete, consisted of reagent range-finding experiments on a pit-by-pit basis using composite samples from individual waste pits. The advanced phase consists of testing on strata samples where available. Each phase contains two stages permitting additional reagent testing as necessary. An optional phase to evaluate waste form durability is also being considered.

Status:

Final analysis on vitrified and cement waste forms is being completed. Data comparison will begin shortly for the Treatability Report. Discussions on format for the report will take place over the next several weeks. Radon leach samples which were delayed due to contractual problems with the analytical lab, are being prepared. Schedule impacts due to this delay will be assessed. Preliminary indications are that the impact will be minimal and should not impact the overall treatability schedule.

Issues/Corrective Actions:

None to report.

1.3 Remedial Investigation

Scope:

A RI Report will be prepared in accordance with the U.S. EPA Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (EPA Directive 93553-01) and the approved Risk Assessment Work Plan Addendum.

Status:

Comments on the submitted Draft RI Report were received from DOE-FN and Argonne National Laboratory, and are currently being addressed.

The final draft of the RI Report will be submitted to DOE in June 1993.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

1.3 Remedial Investigation (continued)

Issues\Corrective Actions:

None to report.

OU1 REMEDIAL INVESTIGATION REPORT **PRIMARY**

SCOPE	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Details the nature and extent of contaminants within the Operable Unit 1 study area. Estimates the volume of contaminated media and materials. Provides a baseline risk assessment and establishes remedial action objectives.	10/12/93 C	12/11/93 C	01/10/94 C

C = Consent Agreement Date

1.4 Planned Activities for April 1993

- Radon leach samples will be prepared and tested. Format for the transfer of data and reports will be determined for inclusion in the Operable Unit 1 Treatability Report.
- Continue to revise the Draft Remedial Investigation Report, including the Baseline Risk Assessment.
- A presentation on the status of the Operable Unit 1 Remedial Investigation Report, including data packages and how this data will support Operable Unit 1's planned path forward, will be presented to U.S. EPA Region 5 on April 13, 1993.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

2.0 Operable Unit 2

Operable Unit 2, as defined in the Amended Consent Agreement, includes the flyash piles, other South Field disposal areas, lime sludge ponds, solid waste landfill, berms, liners, and soil within the operable unit boundary.

2.1 Field Investigation

2.1.1 Work Plan Addendum - Installation of Monitoring Well 1433

Scope:

The Work Plan Addendum provides for installation of Monitoring Well 1433 in the northwest area of the South Field, near Boring 1401. This well is desirable to further characterize the fill/soil material by sampling any perched groundwater/leachate that may be present at that location that was not previously encountered.

Status:

Groundwater samples from Monitoring well 1433 were collected on November 18, 1992 for full Hazardous Substance Listing, full radiological, and general groundwater quality parameters. Results from the on-site FEMP laboratory analysis indicate Total Uranium concentrations at 4,200 ppb. The contract laboratory has completed the analysis of the soil samples retrieved during the installation of the well and the groundwater samples.

Data validation and database entry functions are continuing.

Issues/Corrective Actions:

Follow-on groundwater sampling of the well and further systematic investigation activities of the area encompassing Monitoring Well 1433 are planned under the RI field investigations as presented in the Sampling and Analysis Plan for the RI/FS Work Addendum for Operable Unit 2.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

2.1 Field Investigation (continued)

2.1.2 RI/FS Work Plan Addendum for Operable Unit 2

Scope:

The Remedial Investigation (RI) Report for Operable Unit 2 was submitted to the U.S. EPA and Ohio EPA in October 1992. Based on December 17, 1992, review comments from the U.S. EPA and Ohio EPA on the RI Report, and responses to those comments submitted on February 7, 1993, a second phase of RI sampling and analysis is required for Operable Unit 2 in order to meet the objectives of the March 1988 Sitewide Remedial Investigation/Feasibility Study (RI/FS) Work Plan.

Status:

A Sampling and Analysis Plan (SAP) for collection and analysis of additional environmental samples in Operable Unit 2 has been prepared in accordance with CERCLA Guidance for Conducting Remedial Investigations and Feasibility Studies.

The draft SAP was submitted to the EPAs on March 8, 1993. Pursuant to the informal dispute resolution process with the U.S. EPA, field investigations were initiated on March 16, 1993. Work Plan approval with comments were received from the U.S. EPA and Ohio EPA on March 23, 1993. Preparation of a final SAP with response to comments is in progress.

Drilling at Monitoring Well 2945 was completed to an approximate depth of 60 feet. The FERMCO on-site laboratory conducted a sieve analysis to determine the proper size well screen and sand to install the well. Split-spoon samples were completed for geotechnical analysis and archival of remaining sample media.

Hydropunch operations at 11014 (SF-HP-06) and 11015 (SF-HP-07) were completed in March 1993. The groundwater sample for 11014 was taken between 5'-0" and 9'-0". Preliminary Total Uranium results obtained from the on-site FERMCO laboratory indicate 580 ug/L (580 ppb). The groundwater sample for 11015 was taken between 7'-6" to 9'-0". Preliminary Total Uranium results obtained from the on-site FERMCO laboratory indicate 270 ug/L (270 ppb).

All surface soil samples (0" to 6") and near surface soil sampling (6" to 12") were completed.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

2.1 Field Investigation (continued)

Three out of four required sediment samples were completed in March 1993. The fourth sediment sample at a South Field location (SF-SD-04) was not collected because surface water was not encountered.

Two out of four surface water samples were collected (SF-SW-04 and SF-SW-03). No surface water was encountered at the other two locations.

Drilling at Monitoring Well 2949 was completed to a depth of 79 feet. The sample for sieve analysis was transferred to the on-site FERMCO laboratory. Split-spoon samples were taken for geotechnical analysis and archival of remaining sample media.

Surveying for the twelve surface sampling locations were completed in March 1993.

Issues/Corrective Actions:

None to report.

2.2 Treatability Studies

Scope:

This study is complete except for final revision to the Treatability Study Report. These results support the FS and subsequent remedy selection for Operable Unit 2. The study demonstrated that waste stabilization can achieve the desired level of material strength and provides quantitative leaching data for geochemical and computer modeling of groundwater contaminant transport.

Status:

A final Feasibility Study report will be issued in accordance with the revised schedules for Operable Unit 2.

Issues/Corrective Actions:

None to report.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

2.3 Remedial Investigation

The RI provides a summary of the field investigations and supports the FS by defining the nature and extent of the contaminants in the Operable Unit 2 study area, estimating the volume of contaminated media and materials, and providing a Baseline Risk Assessment which establishes remedial action objectives.

Status:

The draft RI report was submitted to the EPAs on October 16, 1992. Comments were received from the U.S. EPA and the Ohio EPA on December 18, 1992. U.S. EPA disapproved the Draft RI report due to inadequate data on the nature and extent of contamination. Meetings were held with the U.S. EPA and Ohio EPA on February 17 and 23, 1993 to present a proposed data collection program and revised RI/FS schedule. The submittal date for the RI/FS, and Draft ROD would be revised.

Issues/Corrective Actions:

Additional field work is planned to obtain the required data. A revised RI/FS schedule will be proposed.

OU 2 REMEDIAL INVESTIGATION REPORT **PRIMARY**

SCOPE	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Details the nature and extent of contaminants within the Operable Unit 2 study area. Estimates the volume of contaminated media and materials. Provides a baseline risk assessment and establishes remedial action objectives.	10/16/92 A	12/18/92 C	To be determined

C = Consent Agreement Date A = Actual Completion Date

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

2.4 Feasibility Study

The FS evaluates alternatives in detail with respect to the nine evaluation criteria developed by the U.S. EPA. The alternatives are analyzed individually against each criterion and then compared against one another to determine their respective strengths and weaknesses, and to identify the key tradeoffs that must be balanced for the operable unit.

Status:

The revised schedule for the Operable Unit 2 RI/FS program, is being evaluated through the informal dispute resolution process.

Issues:

Schedules are currently being revised due to EPA disapproval of the Remedial Investigation Report. Information will be reported as received. A Preliminary Draft Schedule for the Operable Unit 2 RI/FS has been developed. The FS schedule continues to be very tight with little or no float available.

Corrective Actions:

The FS is being performed by FERMCO.

OU 2 FEASIBILITY STUDY REPORT **PRIMARY**

SCOPE	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Describes and analyzes potential remedial alternatives. A comparative analysis is performed for all alternatives.	03/15/93 C	05/13/93 C	06/13/93 C

C = Consent Agreement Date

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

2.5 Planned Activities for April 1993

- Continue with the field activities in the South Field and the Solid Waste Land Fill.
- Commence field activities associated with the Inactive Flyash Pile, the Active Flyash Pile and Lime Sludge Ponds.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

3.0 Operable Unit 3

Operable Unit 3, as defined in the Amended Consent Agreement, includes the Production Area and production-associated facilities and equipment (including all above and below-grade improvements) including, but not limited to, all structures, equipment, utilities, drums, tanks, solid waste, waste, product, thorium, effluent lines, K-65 transfer lines, wastewater treatment facilities, fire training facilities, scrap metal piles, feed stocks, and coal pile.

3.1 RI/FS Work Plan

Scope:

The purpose of the RI/FS Work Plan is to detail the approaches and assumptions to be applied to the gathering of information and the presentation of results. Specifically, the Operable Unit 3 RI/FS Work Plan identifies the approach to be employed for baseline risk assessment and the specific sampling and sampling strategy to be performed during the field investigation program.

Status:

Comments and conditional approval of the RI/FS Work Plan Addendum (WPA) were received from the Ohio EPA by letter of February 16, 1993. In a letter of February 17, 1993, the U.S. EPA also provided comments but disapproved the WPA pending incorporation of the comments. Responses to the comments were provided to the EPAs on March 19, 1993. The WPA will be revised at a later date, after agreement on the acceptability of the proposed changes reflected in the responses to EPA comments.

Issues/Corrective Actions:

None to report.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

3.1 RI/FS Work Plan (continued)

OU 3 WORK PLAN ADDENDUM

SCOPE	RECEIVE FROM EPA	SUBMIT TO EPA
The Work Plan Addendum includes an initial evaluation of Operable Unit 3 (e.g., conceptual models and waste/contaminant quantities), a work plan rationale (e.g., data requirements and SAP approach) and specific OU3 RI/FS tasks.	08/04/92 A	12/18/92 C 12/17/92 A

C = Consent Agreement Date A = Actual

3.2 Field Investigation

Scope:

The purpose of the Operable Unit 3 field investigation program is to gather information necessary to perform a baseline risk assessment, further identify the nature of contaminants in the operable unit, refine estimates of volume of contaminated materials, and support initial screening of applicable alternatives.

Status:

The Risk Management Plan and Risk Assessment Report for Operable Unit 3 RI/FS Characterization were completed in March. Twenty-four Operable Unit 3 RI/FS Characterization procedures have been completed; three additional procedures are in review. Lesson Plans for the Operable Unit 3 procedures continue to be developed by Training with input from Operable Unit 3 Field Investigations. Preparation for a Readiness Review to begin the RI/FS characterization is underway. An Independent Assessment program is being developed for the Operable Unit 3 Field Investigations Manager by the ES&H Self Assessment Section.

Issues/Corrective Actions:

None to report.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

3.3 Treatability Studies

Scope:

The purpose of treatability studies is to gather information necessary to support remedy selection and implementation. Specific studies will be structured to gather the necessary information.

Status:

Formal identification of treatability studies for Operable Unit 3 has not been undertaken; however, remedy screening treatability studies will be conducted in parallel with the Field Investigation and Alternatives development. Development of an outline for a Treatability Study Work Plan (TSWP) was initiated in January. The proposed revision of the RI/FS WPA identifies a delivery date for the TSWP of January 1994.

Issues/Corrective Actions:

None to report.

3.4 Remedial Investigation Report

Scope:

The purpose of the RI is to provide a summary of the field investigations and to support the FS by defining the nature and extent of the contaminants in Operable Unit 3, estimating the volume of contaminated media and materials, and providing a baseline risk assessment which establishes remedial action objectives.

Status:

With the exception of planning the report content and layout, formal development of the RI has not begun.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

3.5 Feasibility Study

Scope:

The purpose of the FS is to evaluate alternatives in detail with respect to the nine U.S. EPA evaluation criteria. The alternatives are analyzed individually and then compared to one another to determine respective strengths and weaknesses and to identify key tradeoffs.

Status:

Formal activities associated with the FS have not been initiated for Operable Unit 3, although ISA research and document layout planning are underway. The proposed revision of the RI/FS WPA proposes consolidation of the ISA with the FS due to uncoupling of D&D activities into the Proposed Plan for Interim Action.

Issues/Corrective Actions:

None to report.

3.6 Planned Activities for April 1993

- Focus on technology research and initiate identification of remedy screening tier treatability studies.
- Continue Proposed Plan document preparation to achieve an interim Record of Decision for D&D of components for OU3.
- Prepare Remedial Design Work Plan outline for Proposed Plan for Interim Action (D&D).
- Prepare Treatability Study Work Plan outline.
- The full-scale writing of Field Work Packages will be initiated.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

3.6 Planned Activities for April 1993 (continued)

- The Operable Unit 3 Characterization Health and Safety Plan will be provided for review in April.
- A portion of Building 5E is being cleared in preparation for setting up a storage area for the Operable Unit 3 sampling equipment.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

4.0 Operable Unit 4

Operable Unit 4, as defined in the Amended Consent Agreement, consists of Silos 1, 2, 3, and 4, the silo berms, the Decant Sump Tank System, and soil within the operable unit boundary.

4.1 Field Investigation

4.1.1 Sampling West of K-65 Silos 1 and 2

Scope:

The information obtained through this additional investigation will augment the current understanding and conclusions drawn from previous sampling and analytical results which have been used to characterize the extent of contamination in the vadose zone and groundwater in the glacial overburden immediately west of the K-65 Silos 1 and 2. Two 1000 series piezometers will be installed in the uppermost perched water interval in the K-65 Silos area. One well or lysimeter will target the perched water zone down gradient of the Decant Sump Tank. Three lysimeters will be installed in the east bank of Paddy's Run to verify that contamination from the vadose zone or perched water is not entering the stream.

Status:

The completed work plan addendum was processed as part of the Operable Unit 4 RI/FS baseline and was approved by the Level III, II, and I Change Control Boards on January 15, 1993, January 22, 1993, and January 27, 1993, respectively. Due to the schedule constraints associated with the completion of the investigative effort in time to include the additional data into the Operable Unit 4 Feasibility Study Report, the DOE-FN has authorized FERMCO to proceed with the implementation of the work plan without the U.S. EPA formal approval of the addendum. This notice was given by DOE-FN with the confidence that previous U.S. EPA concerns about this project have been adequately addressed in the work plan and proposed field work.

Notice to Proceed was given to the subcontractor on February 1, 1993. Field work was initiated on February 9, 1993. Drilling activities were initiated on March 11, 1993.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

4.1 Field Investigation (continued)

Comments and disapprovals on the Work Plan Addendum for Additional Characterization of the Perched Water West of the K-65 Silos from the Ohio EPA and the U.S. EPA were received on March 22, 1993. A meeting is scheduled for April 1, 1993 with DOE and the U.S. EPA to discuss resolution of the disapproval/comments of the Work Plan Addendum. A formal response to the Ohio EPA and U.S. EPA comments will be submitted on April 21, 1993.

Issues/Corrective Actions:

The information obtained from this investigation program will be considered in the Operable Unit 4 Feasibility Study. Highest priority must be given to these field investigations to avoid schedule delays to the Operable Unit 4 Feasibility Study Report submittal. The results from this sampling effort will be integrated into the Operable Unit 5 Remedial Investigation Report. If the field investigation, perched groundwater analyses, and data validation is completed in a timely fashion, the information will be presented in the Final RI Report for Operable Unit 4.

4.2 Treatability Studies

Scope:

A Treatability Study Work Plan addresses the additional information that is required to support the FS and subsequent remedy selection for Operable Unit 4. There are two separate treatability studies to support the Operable Unit 4 FS. One study considers cement stabilization of Silos 1, 2, and 3 material and chemical extraction, leachate precipitation, and leachate stabilization of Silos 1 and 2 material. The second treatability study considers the vitrification of Silos 1, 2, and 3 material.

The Treatability Study Work Plan for cementation and chemical extraction will demonstrate whether stabilization achieves the desired level of material strength, provide information to help determine the effectiveness of chemical extraction, and provide data for use in fate and transport modeling. The study is composed of three preliminary phases, an advanced phase, and an optional phase. The preliminary phases determined the potential reagents and conditions for stabilization and/or extraction of composites of the silo material. The advanced phase evaluated the material variability by testing formulations and/or extraction on the top, middle, and bottom layers from each silo. The optional phase consists of

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

4.2 Treatability Studies (continued)

testing stabilized waste for durability using American Society of Testing and Materials wet/dry and freeze/thaw test methods. In addition, radon emanation and radon leaching of cement stabilized waste and precipitate will be performed.

The Treatability Study Work Plan for the vitrification of residues from Silos 1, 2, and 3 considers vitrification of silo material, radon emanation rate from the vitrified waste, and the leachability of the vitrified waste.

Status:

Stabilization Experiments - Complete.
Chemical Extraction tests - Complete.

The draft Cement Stabilization/Chemical Extraction Treatability Study Report was submitted for internal review on March 31, 1993. Comments will be incorporated and the draft report will be submitted to the Ohio EPA and the U.S. EPA for their review in May 1993.

Vitrification Treatability Tests - Complete.

The draft Vitrification Treatability Study Report was submitted for internal review on March 11, 1993.

Optional Treatability Test - radon leaching on stabilized material and material from Chemical Separation is complete with data to be available in early April 1993. Radon emanation tests were completed in January 1993. The Cement Stabilization 120-day static leach analytical data validation was completed on March 31, 1993. Durability testing was completed in late March 1993 and evaluation of durability testing results are in progress.

Issues/Corrective Actions:

None.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

4.3 Remedial Investigation Report

Scope:

The RI provides a summary of the field investigations and supports the FS by defining the nature and extent of the contaminants in the Operable Unit 4 study area, estimating the volume of contaminated media and materials, and providing a baseline risk assessment which establishes remedial action objectives.

Status:

Revisions continue to the draft Operable Unit 4 Remedial Investigation Report. The RI report was transmitted to DOE-HQ and a formal presentation on changes to the report was given to DOE-HQ on March 11, 1993. Currently comments from DOE-HQ are being incorporated into the RI report for their final approval and transmittal to U.S. EPA on April 19, 1993.

4.3 Remedial Investigation Report (continued)

OU4 REMEDIAL INVESTIGATION REPORT **PRIMARY**

SCOPE	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Details the nature and extent of contaminants in the Operable Unit 4 study area. Estimates the volume of contaminated media and materials. Provides a baseline risk assessment and establishes remedial action objectives.	04/19/93 C	06/18/93 C	07/18/93 C

C = Consent Agreement Date

4.4 Feasibility Study

Scope:

The FS evaluates alternatives in detail with respect to the nine evaluation criteria developed by the U.S. EPA. The alternatives are analyzed individually against each criterion and then compared against one another to determine their respective strengths and weaknesses, and to identify the key tradeoffs that must be balanced for the site.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

4.4 Feasibility Study (continued)

Status:

The revision of alternatives, described in the U.S. EPA-approved ISA, is designed to provide separate alternatives for the different waste subunits. For example, alternatives for the disposition of Silos 1, 2, and 3 contents are being created; silo structures, berms, and subsoils are being grouped into a separate set of alternatives; and Silo 4 is being dispositioned in a separate set of alternatives. On-property disposal options were discussed during October 1992 and are being included as appropriate to the alternatives. Detailed alternative description revisions are ongoing. Cost estimates, alternative risk assessments and fate and transport modeling are also ongoing.

Issues/Corrective Actions:

The Operable Unit 4 Feasibility Study will contain the first site-wide integrated FS/EIS and also the first sitewide Comprehensive Response Action Risk Evaluation (CRARE). Presentation of the required technical information and integration with the RI/FS guidance for both documents is priority issues.

OU4 FEASIBILITY STUDY **PRIMARY**

SCOPE	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Describes and analyzes potential remedial alternatives. A comparative analysis is performed for all alternatives.	09/10/93 C	11/10/93 C	12/09/93 C

C = Consent Agreement Date

4.5 Planned Activities for April 1993

- Continue FS and CRARE Risk Assessment activities.
- Continue durability testing as part of the Optional Treatability Program.
- Continue revisions to RI, based on DOE and FERMCO comments and submit the RI and Baseline Risk Assessment to U.S. EPA.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

4.5 Planned Activities for April 1993 (continued)

- Rerun air model for Operable Unit 4.
- Continue Feasibility Study development.
- Complete draft Vitrification Treatability Study Report.
- Complete draft Cement Stabilization/Chemical Extraction Treatability Study Report.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

5.0 Operable Unit 5

Operable Unit 5, as defined in the Amended Consent Agreement, includes groundwater, surface water, soil not included in the definitions of Operable Units 1 - 4, sediments, flora, and fauna.

5.1 Field Investigation

5.1.1 Operable Unit 5 Work Plan Addenda

Scope:

Soil and perched groundwater sampling will be conducted in the following areas under this program: the Plant 1 Pad, the Southeast Quadrant of the Production Area, the Fire Training Area, the KC-2 Warehouse Area, Scrap Metal Area and Electrical Substation, the K-65 Slurry Line and the Clearwell Line.

Status:

On November 30, 1992, conditional approval was received from the Ohio EPA to proceed with the field investigations. On December 2, 1992, the U.S. EPA also provided conditional approval of the Work Plan. Conditional approval from both agencies was based upon the necessity to respond to specific comments which appear to be minor. It was determined in January 1993 to initiate field investigations for the KC-2 Warehouse Area even though comments from the regulators indicated concerns and issues that require further resolution.

The responses to the additional comments from the Ohio EPA and U.S. EPA are pending completion of a FERMCO and DOE-FN internal review. After completion of the internal review, responses will be transmitted to the respective regulatory agency. The Work Plan Addenda will be revised once final comment resolutions have been obtained from the regulatory agencies, DOE-FN, and FERMCO.

The first and second round of groundwater samples from the ten existing monitoring wells and eight of the nine new monitoring wells, located in the K-65 Slurry and Clearwell Line area, have been completed. The RI/FS contract laboratory completed analysis of the first round and second round of groundwater samples for Hazardous Substance List (HSL) volatiles, general water quality, and full radiological parameters for the ten existing and

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

5.1 Field Investigation (continued)

eight of the nine new monitoring wells. Data validation continues on the completed analysis. Database entry operations are proceeding concurrent with completion of data validation efforts.

Well development activities were attempted again at Monitoring Well 1842 in March 1993. However, due to extremely slow recharge rates, the first round of groundwater sampling has not occurred.

The nine new wells which were installed according to the Work Plan for this task and the status of each are as follows:

- 1836 Installation completed. Well development and first and second round of groundwater sampling completed.
- 1837 Installation completed. Well development and first and second round of groundwater sampling completed.
- 1838 Installation completed. Well development and first and second round of groundwater sampling completed.
- 1839 Installation completed. Well development and first and second round of groundwater sampling completed.
- 1840 Installation completed. Well development and first and second round of groundwater sampling completed.
- 1841 Boring complete. Well not installed because groundwater was not encountered at this location.
- 1842 Re-installation completed. The well was developed in March 1993; however, due to an extremely slow recharge rate, the first round of groundwater sampling has not occurred.
- 1843 Installation completed. Well development and first and second round of groundwater sampling completed.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

5.1 Field Investigation (continued)

- 1844 Installation completed. Well development and first and second round of groundwater sampling completed.

The Work Plan calls for only one round of groundwater sampling at existing Monitoring Wells 1173 and 1174 in the Southeast Quadrant. In February 1993, groundwater sampling of Monitoring Well 1173 was completed. Monitoring Well 1174 was found to be damaged and can not be sampled under this program. Planning is underway to provide a replacement well for Well 1074. The replacement for 1074 will be provided under the Operable Unit 5 Addenda. The contract laboratory completed the analysis on the first round of groundwater samples from Monitoring Well 1173.

Monitoring Wells 1866, 1868, and 1869 were installed. A boring was drilled and soils were sampled at Location 0867 per the Work Plan Addenda; however, no groundwater was encountered and the boring was plugged and abandoned. First round of groundwater sampling was completed for Monitoring Wells 1866 and 1868. Attempts were made to develop and sample Monitoring Well 1869; however, due to extremely slow recharge rates, the first round of groundwater sampling could not be completed. The laboratory completed the radiological and chemical analysis for samples from Monitoring Wells 1866 and 1868.

The contract laboratory is continuing with the radiological analysis for the first round of groundwater sampling of Monitoring Well 1887 located in the Fire Training Area. The contract laboratory completed the analysis of the chemical parameters for the first round of groundwater samples on Monitoring Well 1887.

Attempts to develop and sample Monitoring Well 1890 continue; however, due to extremely slow recharge rates, the sampling could not be performed.

The contract laboratory completed chemical and radiological analysis of the four hand auger samples taken in the stormwater ditches. Laboratory analysis continued for the radiological parameters on the single hand auger sample taken in the sump of the Fire Training Area.

The contract laboratory completed the analysis on the radiological and chemical parameters of the 14 auger borings taken in the Plant 1 Pad Area.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

5.1 Field Investigation (continued)

The contract laboratory completed analysis of the chemical and radiological parameters on the first round of groundwater taken from the existing Monitoring Wells 1338, 1339, 1343, and 1348.

The samples taken during the field investigations for the KC-2 Warehouse Area, Scrap Metal Pile, and Electrical Substation are being analyzed at the contract laboratory for the radiological parameters. The contract laboratory completed the chemical parameter analysis of samples collected for the subject areas.

Issues/Corrective Action:

Final resolution of the Ohio EPA and U.S. EPA comments that were received in December 1992 should be made with resolutions transmitted to the respective regulatory agency for final review and approval.

Lack of comment resolution has caused an apparent negative variance in the Operable Unit 5 Consent Agreement Baseline Schedule. Conditional approval received from the regulatory agencies has provided some schedule recovery through acceleration of both field characterization effort and subsequent sample analysis at the contract laboratories.

5.1.2 Outfall Line Investigation

Scope:

This Work Plan Addendum defines the sampling and analysis required to investigate potential leakage from the Outfall Line as part of the Operable Unit 5 RI. The installation of Monitoring Well 2119 and subsequent sampling program were based on possible failure of the pipeline between Manhole 179 and 180.

If groundwater contamination has occurred due to a failure in the pipeline between Manhole 179 and 180, then a previously unidentified occurrence of contamination in groundwater may exist beyond the FEMP eastern boundary. Installation of Monitoring Well 2119 will determine if there is groundwater contamination associated with a pipeline failure between Manholes 179 and 180.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

5.1 Field Investigation (continued)

Status:

Hydropunch II operations and subsequent installation of Monitoring Well 2119 was completed in January 1993. First round of groundwater sampling was completed January 27. Second round of groundwater sampling is scheduled for April 6. The contract laboratory has completed all analysis for the samples taken to date from Monitoring Wells 2119 and 2067.

Responses to the December 1992 additional comments from the Ohio EPA and U.S. EPA are pending completion of an internal review. However, the evident lack of contamination in the monitoring well sample reduced the applicability of the comments. After completion of the internal review, responses will be transmitted to the respective regulatory agency. The Work Plan Addenda will be revised once final comment resolutions have been obtained from the regulatory agencies, DOE-FN, and FERMCO.

Issues/Corrective Actions:

Final comment resolution of the Ohio EPA and U.S. EPA comments received in December 1992 should be made with resolutions transmitted to the respective regulatory agency for final review and approval.

5.1.3 Installation of Monitoring Well 2166

Scope:

This Work Plan Addendum will provide a vertical profile of uranium concentration data for the water column upgradient of Homeowner Well 13, and a monitoring location at the vertical depth with the maximum uranium concentration. Homeowner well groundwater sampling has detected an increase in total uranium in water pumped from Homeowner Well 13.

Homeowner Well 13 is completed approximately 20 feet beneath the water table contact. Monitoring Well 2398 indicates total uranium concentrations of 1.4 µg/L and 3.7 µg/L at the water table contact. A vertical profile of uranium concentration, upgradient of Homeowner Well 13, is needed to determine at what level beneath the water table contact uranium concentrations are the greatest.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

5.1 Field Investigation (continued)

Status:

The second and final round of groundwater sampling was completed on Monitoring Well 2166 January 25. The contract laboratory completed the analysis of the second round of groundwater samples. This activity is complete and will not be updated in future reports.

Issues/Corrective Actions:

None to report.

5.2 Treatability Study

Scope:

The purpose of this study is to provide information to support the FS and subsequent remedy selection for Operable Unit 5. Specifically, the study will demonstrate the feasibility of soil washing as a remedial technology for cleaning soils in Operable Unit 5. The study incorporates a physical separation/chemical extraction process that initially involves the separation of a soil into different particle-size fractions. Reagent formulas in the washing solutions are used in the extraction of radionuclides and organic and inorganic compounds from these different-size fractions. The contaminants may be separated from the wash stream into a concentrated residue for further treatment. The study consists of two phases: (1) remedy screening Stages 1 and 2, involving laboratory and bench-scale tests; and (2) remedy selection using pilot-scale equipment. Soils from three different areas will be used in these investigations. These soils are from the following areas: incinerator area (ID-A), Plant 1 Pad Area (ID-B), and maintenance building area (OU 5-A).

Status:

DOE-FN received a letter from U.S. EPA dated June 22, 1992, agreeing with the revised comment responses to the Work Plan. These responses have been incorporated into the final Treatability Study Work Plan that was distributed on August 4, 1992. As of December 31, 1992, U.S. EPA and Ohio EPA have approved this Work Plan.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

5.2 Treatability Study (continued)

Remedy screening Stage 2 testing of ID-A and ID-B soils was completed in January 1993. Remedy screening Stages 1 and 2 testing of the Operable Unit 5 soil is in progress with a scheduled completion in April 1993. Pilot plant design for skid assembly and utilities and fabrication of the skids was completed with a scheduled construction completion date of early April 1993. System startup is anticipated for April 1993.

Issues/Corrective Actions:

None to report.

5.3 Initial Screening of Alternatives (ISA)

Scope:

The ISA Report documents the initial activities of the Feasibility Studies (FS). These activities include developing remedial action objectives; developing general response actions; identifying volumes or areas of media to which response actions might be applied; identifying and screening technologies; identifying and evaluating technology process options; assembling selected representative process options into alternatives; and performing an initial screening of alternatives.

Status:

A draft copy of the ISA Report was submitted to the Ohio EPA and U.S. EPA for review on November 13, 1992. Comments from both agencies were received in January 1993. A response to comments document was prepared and transmitted to both agencies on February 12, 1993. Approval of the responses (with one exception) has been received. The final ISA report has been prepared and was submitted to the Ohio EPA and U.S. EPA on March 26, 1993. This is more than three months ahead of the original Consent Agreement schedule date.

Issues/Corrective Actions:

None to report.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

5.4 Remedial Investigation (RI)

Scope:

The RI serves as the mechanism for collecting data to characterize site conditions; determining the nature of the site's wastes; determining the nature and extent of contamination; and assessing baseline risk to human health and the environment.

Status:

RI data compilation and evaluation continues. All data sources to be included in the RI are being identified and evaluated. Chemical and radiological data collected as part of both the RI/FS and other site sampling programs are being posted on maps and evaluated. The geologic and hydrogeologic information contained in RI/FS and site files and documents is being compiled, evaluated, and updated. Existing maps and cross sections are being updated where additional information has become available. New maps and cross sections of the glacial overburden have been generated.

A presentation on preliminary results of the RI data evaluation was given to FERMCO and DOE staff on March 18. The possibility of additional field programs to address data needs identified in the evaluation was also discussed. A similar presentation will be given to U.S. EPA and Ohio EPA on April 1.

A significant data validation effort was initiated in January and became fully operational in February. A backlog of nearly 8,000 RI/FS samples requiring validation have been identified. Validation of all these samples is scheduled for completion in May 1993.

Draft version of RI Report Sections 1 and 2 have been prepared; FERMCO internal review is underway. The draft version of Section 3 will be completed in April. Work on improving the current regional aquifer model continues. Two reports have been prepared: (1) a Groundwater Modeling Report documenting previous modeling activities; and (2) a Groundwater Model Improvement Plan. Both of these reports are in internal FERMCO review; submission to DOE-FN is scheduled for April.

Work on evaluating groundwater and surface water background values continues. A report on results of this evaluation will be prepared in April. Work on preparing an ecological risk screening study based on U.S. EPA Region V guidelines continued. Completion of the screening study in May is expected.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

5.4 Remedial Investigation (RI) (continued)

Issues/Corrective Actions:

None to report.

5.5 Planned Activities for April 1993

- Revise the Operable Unit 5 Work Plan Addenda upon receiving final comment resolution of the Ohio EPA and U.S. EPA December 1992 comments.
- Meet with EPA representatives to present and discuss results of the data evaluation.
- Continue RI activities initiated in January 1993 with respect to RI Report Sections 1, 2 and 3, fate and transport modeling, background values.
- Continue validation of backlogged Operable Unit 5 RI data.
- Submit to U.S. EPA and Ohio EPA a draft report on surface water and groundwater background values.
- Complete the development and initial round of groundwater sampling of Monitoring Well 1842 for the K-65 Slurry and Clearwell Line subtask of the Operable Unit 5 Work Plan Addenda.
- Complete the first round of groundwater sampling for new Monitoring Well 1869. Initiate the second round of groundwater sampling for Monitoring Well 1868. Complete the second round of groundwater sampling for Monitoring Well 1866. These wells are located in the S.E. Quadrant subtask of the Operable Unit 5 Work Plan Addenda.
- Attempt development and first round of groundwater sampling of Monitoring Well 1890 in the Fire Training Area subtask of the Operable Unit 5 Work Plan Addenda.
- Begin second round of groundwater sampling for Monitoring Wells 1338, 1339, 1343, and 1348, located in the Plant 1 Pad Area, for the Operable Unit 5 Work Plan Addenda.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

5.5 Planned Activities for April 1993 (continued)

- Initiate second round of groundwater sampling at Monitoring Well 2119 for the Outfall Line Investigation Work Plan Addenda.

- Complete the Work Plan Addenda for the Investigation of the Skeet Shooting Range and for the Study of the Great Miami Riverbank in the vicinity of the outfall line.

- Initiate sampling activities for the additional site characterization programs identified during Operable Unit 5 data evaluation.

- Complete preparation of draft work plans and internal reviews for the following additional site characterization programs which are based on the needs identified during the Operable Unit 5 data evaluation:

  - Sitewide Groundwater Sampling and EWMF Well Sampling Project
  - Skeet Shooting Range Investigation
  - Great Miami River Bank Characterization
  - FEMP Glacial Overburden/Vadose Zone Hydraulic Investigation
  - Surface Water and Sediment Sampling Project
  - Surface and Subsurface Soils Sampling Project
  - Plant 2/3, Production Area and RI/FS Surface Water Snapshot
  - Additional Monitoring Well/Piezometer Installations
  - Pilot Plant West Drainage Ditch Seepage and Surface Water Background Investigation

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

6.0 On-Site Disposal Cell

The Engineered Waste Management Facility (EWMF) scope has been modified to evaluate the On-Site Disposal Cell (OSDC) alternatives along with the complete evaluation of off-site alternatives. All further reference to the EWMF will be entitled OSDC.

The technical approach for the evaluation will be based on a information previously developed for the EWMF. This information is being expanded to include the development of engineering assessment to evaluate the On-Site Disposal/Storage, Off-Site Disposal, and Transportation Risk Assessment for Off-Site Disposal. The information generated by these technical reports and the reports that will be generated from the information gathered for the EWMF Siting Report will serve as a basis for evaluating the disposal options and alternatives.

6.1 EWMF General Siting Report

Scope:

The EWMF Siting Report was scoped to evaluate the feasibility of locating an EWMF facility at the FEMP. The intent was to deliver all of the information necessary to meet the requirements in a singular document. In order to expedite the delivery of the technical information, the report has been subdivided into six stand-alone technical reports. The technical reports will be identified as follows with the appropriate scope:

- Geotechnical Engineering Analysis for an On-Site Disposal Cell - This report will contain the engineering analysis prepared for the EWMF structure. This will include an analysis of the barrier and cap design, drainage system, erosion analysis, slope stability analysis and an estimated cost of construction for an on-site tumulus. The report will be entitled, "Technical Report 5.1A, Engineering Evaluation Report for On-Site Disposal".

- Site Characterization Report - This report will include the investigation and evaluation of the site geology, radiation measurements, well installation diagrams, boring logs, and analytical data. This report will be entitled "Technical Report 5.1B, Site Characterization/Geological Report for On-Site Disposal".

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

6.1 EWMF General Siting Report (continued)

- Material Source Survey - This report will discuss the availability and cost of materials in the local area required to construct the OSDC. This report will be entitled "Technical Report 5.1C, Material Source Survey for On-Site Disposal".

- ARARs Report - This report will identify and discuss the ARARs that will be applicable to the construction of an OSDC. This report will be entitled "Technical Report 5.4, ARARs for On-Site Disposal Cell Concept".

- Survey of Local Geology in the Alternate Siting Areas - This report will cover the investigation of two alternative sites for the OSDC adjacent or near the FEMP situated on bedrock highs. The two sites to be evaluated are the Girl Scout Camp and another located west of the FEMP. The report will be entitled, "Technical Report 5.3A, Geological Report for Off-Site Disposal".

- Ecological Characterization - This report will discuss the ecological characterization of the two off-site locations. The two sites to be evaluated are the Girl Scout Camp and another located west of the FEMP. The report will be entitled, "Technical Report 5.3B, Ecological Characterization of the Off-Property Disposal Cell Study Area".

Status:

A contract has been placed for IT Corporation to complete the six above mentioned technical reports. All six technical reports have been received. The risk-based evaluation of an on-site disposal cell containing treated wastes has been delayed pending further review.

Issues/Corrective Actions:

None to report.

6.2 Planned Activities for February 1993

None.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

7.0 Site-Wide Characterization Report

7.1 Risk Assessment Work Plan Addendum

Scope:

The Risk Assessment Work Plan Addendum provides a detailed scheme for development and completion of a baseline risk assessment for each operable unit, a preliminary site-wide baseline risk assessment, and a remedial action risk evaluation with each operable unit FS.

The Risk Assessment Work Plan Addendum presents the specific risk assessment methods to be followed in the RI/FS risk assessment tasks. It also establishes the scope of risk assessment work and documents the specific approach to determine whether estimated risks associated with selected remedial alternatives for the entire site are protective of human health and the environment. The addendum provides the methods, models, and parameters to develop the baseline risk assessment for each operable unit, the preliminary baseline risk assessment of the Site-Wide Characterization Report (SWCR), the remedial action risk evaluation, and the comprehensive response action risk evaluation for each operable unit FS.

Status:

The (Final) Risk Assessment Work Plan Addendum was transmitted to the U.S. EPA and Ohio EPA on June 19, 1992. Responses to comments received from the U.S. EPA on August 6, 1992, were submitted on September 24, 1992.

Issues/Corrective Actions:

None to report.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

7.2 SWCR Report Preparation

Scope:

The SWCR is a one-time summary of all FEMP site data available as of December 1, 1991. It contains the preliminary baseline risk assessment which estimates human health and ecological risk of the FEMP from a site-wide perspective. The SWCR also provides the initial list of the leading remedial alternatives for each operable unit for input into the FS cumulative response action risk evaluation.

Status:

The revised SWCR, addressing the original (October 1992) and additional (January 1993) comments from the U.S. EPA and the Ohio EPA, will be submitted to DOE for transmittal to the agencies in early April. The report utilizes some risk assessment methodologies over which there is still lack of agreement with the agencies; however, these issues will be addressed in the preparation of the Operable Unit-specific risk assessments.

SITE-WIDE CHARACTERIZATION REPORT **SECONDARY**

SCOPE	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Provides a one-time summary of site characterization data available as of 12/1/91, the Preliminary Baseline Risk Assessment, and a list of the leading remedial alternatives.	08/05/92 A	10/08/92 A	12/1/92 A

C = Consent Agreement Date A = Actual

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

8.0 Community Relations

Status

Following a 45-day public comment period, a Responsiveness Summary for the EE/CA for Removal Action No. 27, Management of Contaminated Structures at the FEMP, was prepared and submitted to U.S. EPA the last week of March. The document addressed all comments made at the public workshop on January 12, 1993 and also incorporated all U.S. EPA and OEPA's comments with DOE's responses.

The public comment period on two DOE documents: Environmental Restoration and Waste Management Five-Year Plan and the Site-Specific Plan concluded March 15, 1993. No comments were received.

On March 23, 1993, a community roundtable was held to discuss Risk Management. Approximately 25 members of the public attended.

After discussion of near-site waste disposal alternatives at the local township meetings, DOE announced March 26 that additional studies of alternative waste disposal sites in Ross and Morgan Townships have been canceled.

DOE and the U.S. EPA have reached a tentative agreement on a series of actions resulting from DOE's inability to meet a scheduled Operable Unit 2 milestone from the 1991 Amended Consent Agreement. Under the tentative settlement, DOE will accelerate schedule milestones for other portions of the cleanup, conduct a supplemental environmental project to reduce uranium discharges to the Great Miami River, and request funds from Congress to pay a penalty assessed by EPA for the failure to meet these milestones.

Several interviews were held with the DOE Environmental Audit team. The team reported at its debriefing that the Community Relations program is one of the "strong points" at Fernald.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES

8.0 Community Relations (continued)

DOE-FN gave an FEMP update at the March 25 Fernald Residents for Environment, Safety and Health (FRESH) meeting. Topics included:

- Summary of the March 23 Risk Management Roundtable
- Status on the development of the new advisory committee
- Update on the rotary kiln
- Discussed alternate near-site waste storage
- Presented tentative agenda for the site tour for FRESH on April 3
- Public water supply (possibility of adding DOE as a customer)
- Details on the action taken to control the bank erosion of Paddy's Run near the Inactive Flyash Pile

Approximately 30 members of the community attended the FRESH meeting. Plans were discussed for the upcoming April 3, 1993 FRESH tour of the Fernald site.

Issues/Corrective Action

None.

Planned Activities for April 1993

FRESH will tour the Fernald site, April 3 from 10 a.m. to 4:30 p.m. Several spots on the agenda include the analytical lab, Emergency Operations Center, in-vivo facility, medical facility, rotary kiln, and weather permitting, the Paddy's Run Erosion Control maintenance.

A roundtable focusing on the rotary kiln start-up will be held April 6, 1993.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

PERIOD ENDING MARCH 31, 1993

ENCLOSURE A

WASTEWATER FLOWS AND RADIONUCLIDE

CONCENTRATIONS UNDER CA SECTION XXIII.B

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

Introduction

The accompanying Effluent Radiation Reports provide, in accordance with the requirements of Section XXIII.B of the Consent Agreement As Amended under CERCLA Sections 120 and 106 (a), data on the daily wastewater flows, radionuclide concentrations, and loadings released to the Great Miami River and an estimate of runoff and radionuclide concentrations to Paddy's Run during March 1993.

Summary - March 1993

The total quantity of uranium discharged from the FEMP to the Great Miami River via Manhole 175 (Outfall 1I000004001) was 93.95 kilograms. The average uranium concentration for the previous 12 months was 0.61 mg/L. This is 68.5% of the Derived Concentration Guide (DOE Order 5400.5) for ingested water.

There was no discharge from the Stormwater Retention Basin (Outfall 1I000004002) to Paddy's Run via the Storm Sewer Outfall Ditch in March 1993. Based on 2.57 inches of rainfall in February 1993, the total quantity of uranium discharged to Paddy's Run from uncontrolled areas of the FEMP is estimated to be 7.30 kilograms.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

Wastewater Flows and Radionuclide Concentrations

Facility: Fernald Environmental Management Project
U.S. Department of Energy
7400 Willey Road, P.O. Box 398705
Cincinnati, Ohio 45239-8705

Location: 1I000004001 Month: March 1993
001 Total Discharge
Manhole 175 (Effluent to the Great Miami River)

Day	Flow (MGD)	Total Alpha (pCi/L)	Total Beta (pCi/L)	Total U (mg/L)	Total U (kgs)	Calculated Total U-238 (pCi/L) (1)
1	1.166	554	959	0.95	4.19	321
2	0.744	428	806	0.81	2.28	274
3	0.573	748	1464	1.33	2.88	449
4	1.047	617	896	1.02	4.04	345
5	1.256	662	1117	1.20	5.70	405
6	0.717	829	1725	1.44	3.91	486
7	0.689	752	1667	1.46	3.81	493
8	1.403	505	793	0.93	4.94	314
9	1.474	459	887	0.90	5.02	304
10	1.499	667	734	0.83	4.71	280
11	1.140	396	1081	0.88	3.80	297
12	0.979	604	1419	1.03	3.81	348
13	0.873	676	1365	1.12	3.70	378
14	0.909	599	1468	1.07	3.68	361
15	0.971	432	1216	0.87	3.20	294
16	0.813	392	838	0.73	2.25	247
17	0.774	581	865	0.95	2.78	321
18	0.634	428	860	0.76	1.82	257
19	0.636	532	883	0.98	2.36	331
20	0.758	568	770	0.94	2.70	318
21	0.579	748	1261	1.44	3.15	486
22	0.576	369	523	0.65	1.42	220
23	0.767	495	532	0.69	2.00	233
24	0.715	378	604	0.67	1.81	226
25	0.581	671	1919	1.19	2.62	402
26	0.529	523	928	0.90	1.80	304
27	0.516	712	1099	1.16	2.26	392
28	0.466	428	910	0.93	1.64	314
29	0.419	608	1230	1.23	1.95	416
30	0.661	324	360	0.61	1.53	206
31	1.147	293	198	0.51	2.21	172
TOTAL	26.011				93.95	

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON -222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

Wastewater Flows and Radionuclide Concentrations

Facility: Fernald Environmental Management Project

Location: 001 Total Discharge

Month March 1993

	Flow (MGD)	Total Alpha (pCi/L)(2)	Total Beta (pCi/L)(2)	Total U (mg/L)(2)	Total U (kgs)	Calculated Total U-238 (pCi/L)(1)(2)
Avg.	0.839	542	985	0.95	3.03	323
Max.	1.499	829	1919	1.46	5.70	493
Min.	0.419	293	198	0.51	1.42	172.

The average uranium concentration for the previous twelve months was 0.61 mg/L. This is 68.5% of the Derived Concentration Guide (DOE Order 5400.5) for ingested water.

Comments:

(1) The activity of this discharge has been and will continue to be reported as Uranium-238 (pCi/L) in accordance with the Ohio EPA format for reporting uranium. Since this does not account for the activity of the other uranium isotopes in the effluent, the total uranium data is also presented. The calculated total U-238 is based on a conversion factor of 337.84 pCi U-238/mg Total U applied to measure value of total uranium.

(2) Average values presented are flow-weighted.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

Wastewater Flows and Radionuclide Concentrations

Facility: Fernald Environmental Management Project
U.S. Department of Energy
7400 Willey Road, P.O. Box 398705
Cincinnati, Ohio 45239-8705

Location: 1I000004002
002 Discharge (Overflow) to Storm Sewer Outfall Ditch
Stormwater Retention Basin Spillway (Effluent to Paddy's Run)

Month: March 1993

There was no discharge to Paddy's Run from the Stormwater Retention Basin.

Based on 2.57 inches of rainfall for the month, the uranium discharge to Paddy's Run from uncontrolled areas of the FEMP is estimated to be 7.30 kgs.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

PERIOD ENDING MARCH 31, 1993

ENCLOSURE B

FFCA: INITIAL REMEDIAL MEASURES

AND OTHER OPEN ACTIONS

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

INTRODUCTION

Enclosure B describes actions undertaken at the FEMP during the period March 1 through March 31, 1993, that are not covered by the reporting requirements of the Consent Agreement As Amended under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Sections 120 and 106(a).

WORK ASSIGNMENTS AND PROGRESS

Descriptions of ongoing work progress are presented in the following sections of this report. The status of ongoing work in support of the Federal Facility Compliance Agreement (FFCA) is summarized in Table 1 of Enclosure B. Completed work previously reported upon has been eliminated for the sake of brevity. In this portion of the report and in Table 1, descriptions of actions are presented in a format consistent with that of the FFCA.

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA)

1. Initial Remedial Measures

   Section C

   K-65 Silo Project - Status information on the K-65 Silo project normally reported in this section is being provided under Operable Unit 4: Silos 1-4.

2. Remedial Investigation/Feasibility Study (RI/FS)

   Status information on the Remedial Investigation/Feasibility Study (RI/FS) normally reported in this section is being provided separately in accordance with the requirements of Section X of the Consent Agreement As Amended under CERCLA Sections 120 and 106(a).

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA)

3. Reports and Record Keeping

Section B

The RI/FS Monthly Technical Progress Report for February 1993 was transmitted to the U.S. EPA on March 22, 1993, as an integral part of the Consolidated Consent Agreement/Federal Facility Compliance Agreement/Federal Facility Agreement for Control and Abatement of Radon-222 Emissions (CA/FFCA/FFA-CARE) Monthly Progress Report in accordance with the requirements of Section X of the Consent Agreement As Amended.

CLEAN AIR ACT (CAA)

Section E

The Quarterly Particulate Emissions Report will now be incorporated into the Annual NESHAP Compliance Report.

RADIATION DISCHARGE INFORMATION

Section A

This information will now be submitted on an annual basis as part of the FEMP Annual Site Environmental Report.

REPORTING REQUIREMENTS

Section B

The Federal Facility Compliance Agreement Monthly Progress Report for February 1993, was transmitted to the U.S. EPA on March 22, 1993, as Enclosure B of the Consolidated Consent Agreement/Federal Facility Compliance Agreement/Federal Facility Agreement for Control and Abatement of Radon-222 Emissions (CA/FFCA/FFA-CARE) Monthly Progress Report.

TABLE 1

STATUS OF ASSIGNMENTS FOR WORK REQUIRED ON FEDERAL FACILITY COMPLIANCE AGREEMENT ACTIONS

MARCH 31, 1993

ACTION	DESCRIPTION	COMPLETION TIME AFTER FFCA SIGNED	FY1992 STATUS
CERCLA			
1.	INITIAL REMEDIAL MEASURES		
1.C	Implement radon control plan approved by the U.S. EPA.	------	No longer applicable. Progress on actions to address radon emissions from the K-65 Silos are being reported separately under Section IX-Removal Actions of the Consent Agreement/FFCA Monthly Progress Report.
2.	REMEDIAL INVESTIGATION/FEASIBILITY STUDY		No action required.
2.A	RI/FS work is to be conducted in accordance with the U.S. EPA guidelines.	N/A	
2.B	--No Action Required--	------	Status information on the RI/FS is being reported in accordance with the requirements of Section X of the Consent Agreement As Amended under CERCLA Sections 120 and 106(a).
2.E	Amend and submit revised RI/FS Work Plan to U.S. EPA if deficiencies are found.		Status information on the RI/FS is being reported in accordance with the requirements of Section X of the Consent Agreement As Amended under CERCLA Sections 120 and 106(a).
2.F	Implement tasks described in the approved RI/FS Work Plan		Status information on the RI/FS is being reported in accordance with the requirements of Section X of the Consent Agreement As Amended under CERCLA sections 120 and 106(a).
3.	REPORTS AND RECORD KEEPING		
3.B	Submit monthly RI/FS progress reports.	monthly	The RI/FS Monthly Progress Report for February 1993 was transmitted to the U.S. EPA on March 22, 1993. (DOE-1389-93)
CLEAN AIR ACT			
B.4	Prepare annual progress report installation and replacement of emission control devices.	yearly	The Fifth Annual Progress Report on the installation and replacement of emission control devices was transmitted to the U.S. EPA on March 9, 1993 (DOE-1305-93).

TABLE 1

STATUS OF ASSIGNMENTS FOR WORK REQUIRED ON FEDERAL FACILITY COMPLIANCE AGREEMENT ACTIONS

MARCH 31, 1993

C.	Provide annual reports to the U.S. EPA per 40 CFR 61.94(c).	yearly	The Annual NESHAP Compliance Report for CY1990 was transmitted to the U.S. EPA on June 25, 1992 (DOE-1912-92).
D.1	Provide U.S. EPA with yearly stack-testing schedule.	yearly	The 1989 stack testing schedule was transmitted to the U.S. EPA on June 16, 1989. A letter (DOE-1615-89) was transmitted to the U.S. EPA on September 15, 1989, indicating that, due to the uncertainty concerning resumption of production at the FEMP, the 1989 FFCA Stack Testing Program was being deferred. In August 1991, the DOE confirmed that no further production would take place at the facility, and renamed the facility the FEMP. Stacks in areas such as the Laboratory are currently being identified for potential testing during FY1993.
D.2	Provide U.S. EPA with stack-test results for stacks tested that year.	45 days	Because the FEMP has been out of production since mid-1989, there was no opportunity to perform stack testing. The DOE, in August 1991, confirmed that no future production will take place at the FEMP. Stacks in areas such as the Laboratory are currently being identified for potential testing during FY1993.
E.1	Maintain records of monthly particulate matter emissions.	------	Ongoing.
E.2	Provide quarterly reports to U.S. EPA on these emissions.	------	The Quarterly Particulate Emissions Report will now be incorporated into the Annual NESHAP Compliance Report.
RCRA			
A.1	Conduct a hazardous waste determination on all waste streams.	30 days	Complete. Pursuant to the Proposed Amended Consent Decree, a RCRA waste evaluation was be conducted on all identified waste streams pertaining to the PACD.
A.2	Commence a hazardous waste analysis program for materials in the landfill and going to the incinerator.	30 days	Complete. Operation of these units was discontinued and data on the waste which had gone to them was provided in a 30-day FFCA deliverable on August 17, 1986.

TABLE 1

STATUS OF ASSIGNMENTS FOR WORK REQUIRED ON FEDERAL FACILITY COMPLIANCE AGREEMENT ACTIONS

MARCH 31, 1993

A.5	Update the facility closure plan to reflect the year the facility expects to begin closure.	30 days	The Facility closure date is dependent upon closure schedules for individual TSD units as presented most recently in Section I of the RCRA Part B Permit Application transmitted to the Ohio EPA and the U.S. EPA on October 30, 1991 (DOE-211-92). Facility closure will be completed on a date the last TSD unit is closed.
RADIATION DISCHARGE INFORMATION			
A.3	Report to U.S. EPA, Ohio EPA and Ohio Department of Health the results of the continuous liquid discharge samples.	yearly	The twenty-first Quarterly Discharge Report for the period October through December 1991 was transmitted to the U.S. EPA on February 20, 1992 (DOE-941-92). This information will now be reported on an annual basis.
REPORTING REQUIREMENTS			
B.	Issue monthly progress report of actions taken to ensure compliance with FFCA requirements.	monthly	February's FFCA Monthly Progress Report was transmitted to the U.S. EPA on March 22, 1993. (DOE-1389-93).

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

PERIOD ENDING MARCH 31, 1993

ENCLOSURE C

FEDERAL FACILITY AGREEMENT:
CONTROL AND ABATEMENT OF RADON-222 EMISSIONS

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

Introduction

The Federal Facility Agreement for Control and Abatement of Radon-222 Emissions (FFA-CARE) between the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (U.S. EPA), signed November 19, 1991, requires that a monthly report be submitted to the U.S. EPA regarding all steps undertaken in the preceding month to implement Part V of the agreement and that all data generated as a result of those actions be submitted.

Enclosure C fulfills those requirements by describing steps taken at the FEMP during the period March 1 through March 31, 1993, to implement Part V, Radon-222 Control and Abatement Plan, paragraphs 19-33 of the FFA-CARE.

After four months of data collection for the applicable parameters, preparation is now underway to evaluate the data for use in the Transport Release Models.

Work Assignments and Progress

In this section of Enclosure C, action descriptions and work progress are presented in a format consistent with that of the FFA-CARE. Immediately following this section are the K-65 Silos Report and the Selected Radon Data Report. Reporting this data is also a requirement included in the U.S. EPA approved Silos 1 and 2 Removal Action Work Plan (Removal Action No. 4).

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

FFA Part, Paragraph(s)	Description of Commitment	FFA Due Date	Status of Commitment
Part V, 19 & 21	Implement the K-65 Silos 1 and 2 Removal Action in accordance with the approved Silos 1 and 2 Removal Action Work Plan.	12/1/91	Completed. Installation of the bentonite completed 11/28/91.
Part V, 20	Reduce radon-222 to a level As-Low-As Reasonably-Achievable (ALARA) with the goal as specified in the Silos 1 and 2 Removal Action Work Plan.	5/22/92	Completed. Concentrations offsite remain well below performance goal of removal action.
Part V, 22	Submit proposed methodology for estimating radon-222 concentration reductions resulting from completion of the Silos 1 and 2 Removal Action.	Within 60 days of completing removal action; 1/27/92.	The Bentonite Effectiveness Environmental Monitoring Plan was resubmitted to the U.S. EPA for comment and approval on 3/13/92. EPA approval was received on 4/24/92. DOE has prepared a revision to the methodology. Comment responses to the U.S. EPA's disapproval of the revised methodology is under way.
Part V, 23	Evaluate performance of the removal action and determine whether or not additional actions are needed prior to final remediation.	None specified.	Methodology for estimating radon-222 concentration reduction submitted to U.S. EPA per paragraph 20 of Part V. The first Bentonite Effectiveness Environmental Monitoring Report was issued to the U.S. EPA on 5/22/92. DOE submitted a revision to the methodology to the U.S. EPA on 12/17/92. Comment responses to the U.S. EPA's disapproval of the revised methodology is under way.

FFA Part, Paragraph(s)	Description of Commitment	FFA Due Date	Status of Commitment
Part V, 24, 25, and 33	Demonstrate compliance with NESHAP Subpart Q at the completion of final remediation using a methodology approved by the U.S. EPA. Applicable to: Silos 1, 2, and 3; Waste Pits 1, 2, 3, 4, and 5 and the Clearwell; and any newly discovered radon-222 emission sources.	None specified.	No information to report for March 1993.
Part V, 26	Directly measure radon-222 flux from Waste Pits 1, 2, 3, 4, and 5 and the Clearwell in the RI/FS under the CERCLA Consent Agreement.	None specified.	Radon sampling is complete for Pits 1, 2, and 3. All measurements were below the criteria set by the U.S. EPA. A final report was issued to the U.S. EPA on 6/25/92. A letter was received from the U.S. EPA on 10/16/92 giving approval of the proposed method for measuring the radon flux from Pit 4. The letter also stated that since the Clearwell is water covered, and Pit 5 is nearly 100% water covered, the flux from Pit 5 and the Clearwell may be assumed to be zero.
Part V, 26	Include direct measurement data from Waste Pits 1, 2, 3, 4, and 5 and the Clearwell in the RI/FS under the CERCLA Consent Agreement.	None specified.	See above.
Part V, 27	Estimate radon-222 emissions from Silo 3 based upon characterization data; include the estimated radon-222 emission data from Silo 3 in the RI/FS that includes Silo 3 under the CERCLA Consent Agreement.	None specified.	Completed. An estimate of radon flux from the K-65 Silo 3 was submitted to the U.S. EPA on 12/17/91. Radon flux for the silo was estimated to be above 20 pCi/m^2-s.
Part V, 28	Submit documentation or estimates of current radon-222 emissions from existing but newly discovered sources that contain radium-226 in sufficient concentrations to emit radon-222 in excess of NESHAP Subpart Q prior to final remediation.	Within 30 days of discovery.	No new sources identified.

FFA Part, Paragraph(s)	Description of Commitment	FFA Due Date	Status of Commitment
Part V, 30	Submit methodology for direct measurement or other appropriate means of characterization of the relevant emissions pursuant to paragraph 29 of the FFA.	Within 45 days of the U.S. EPA response pursuant to paragraph 29.	None required.

FFA Part, Paragraph(s)	Description of Commitment	FFA Due Date	Status of Commitment
Part V, 31	Submit results of measurements pursuant to paragraph 30.	Within 30 days of U.S. EPA approval of characterization method.	None required.
Part VI, 31	Submit monthly report on steps undertaken to implement Part V of the FFA-CARE and the data obtained in the preceding month.	20th day of succeeding month.	The progress report being submitted herewith as an integral part of the CERCLA Consent Agreement Monthly Progress Report.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

Period Ending March 31, 1993

Data Reporting Requirements: RA No. 4: Silos 1 and 2

As defined in the Silos 1 and 2 Removal Action Work Plan and the Federal Facility Agreement, data associated with monitoring the effectiveness of the bentonite installation are included in the following tables: the K-65 Silos Report and the Selected Radon Data Report.

The K-65 Silos Report includes data on the following parameters:

- Ambient temperature and pressure near the silos.
- Silos 1 and 2 headspace temperature.
- Silos 1 and 2 differential pressure.
- Silos 1 and 2 radon headspace concentration.
- Silos 1 and 2 headspace humidity

The Selected Radon Data Report includes radon data from the following locations:

- Air monitoring station number 5 (AMS-5)
- Air monitoring station number 6 (AMS-6)
- Pilot Plant
- Background data
- K-65 Monitoring Data (K-65 NW, K-65 SW, K-65 NE, K-65 SE).

The radon data submitted in Enclosure C: Radon Data for the K-65 Removal Action and in all previous consent agreement status updates is considered to be draft. The radon data, although collected by qualified technicians using detailed procedures, was not obtained in a manner which would withstand a rigorous validation process. The various field and laboratory procedures are currently being reviewed and modified to be in accordance with the conditionally approved Site-Wide CERCLA Quality Assurance Project Plan (SCQ). Once the sampling and analysis procedures have been modified and approved, along with specific validation protocols, suspect radon data will either be qualified or rejected.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/
FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT

FACILITY: Fernald Environmental Management Project
U.S. Department of Energy
7400 Willey Road, P.O. Box 398704
Cincinnati, Ohio 45239 Hamilton

K-65 SILO REPORT

LOCATION: Silo # 1 DATE: March 1993

Day	Ambient Temp Deg. F	Ambient Pres In. Hg.	Temperature Head Space Deg. F	Inter. Hum. %	Diff. Pres In. HG	Head Space Radon (pCi/l)
1	26.0	29.5	35.4	N/A	-0.010	51603
2	35.7	29.3	35.9	N/A	-0.018	99724
*3	38.6	28.8	36.0	N/A	-0.077	23704
4	33.2	29.0	37.1	N/A	0.016	17008
*5	27.8	29.2	36.9	N/A	0.116	4076
*6	33.7	29.3	36.9	N/A	-0.005	31579
*7	37.4	29.2	37.4	N/A	0.029	38204
*8	37.1	29.3	37.6	N/A	-0.001	2492
9	37.1	29.5	37.8	N/A	-0.008	26770
10	37.4	29.2	38.2	N/A	-0.009	58603
11	31.0	29.5	38.2	N/A	-0.010	7754
12	28.0	29.6	38.0	N/A	-0.010	15069
13	20.4	29.2	37.5	N/A	-0.014	6063
14	15.4	29.5	36.7	N/A	-0.013	6102
15	26.7	29.7	36.1	N/A	-0.009	47284
16	39.6	29.6	36.7	N/A	-0.024	20961
*17	29.1	29.8	37.2	N/A	0.062	5984
*18	21.3	29.9	36.7	N/A	0.042	5577
19	29.2	29.8	36.5	N/A	-0.009	54102
20	36.1	29.7	36.8	N/A	-0.083	36725
*21	36.9	29.7	37.2	N/A	-0.020	48140
22	44.2	29.7	37.8	N/A	-0.007	28601
*23	51.4	29.4	38.8	N/A	-0.039	108341
24	45.8	29.5	39.6	N/A	-0.007	46295
25	47.3	29.6	40.0	N/A	-0.006	10040
26	51.7	29.5	40.8	N/A	-0.005	6870
27	46.6	29.4	41.4	N/A	-0.006	14099
28	48.5	29.3	41.7	N/A	-0.006	19330
29	54.3	29.3	42.1	N/A	-0.004	49423
30	52.1	29.3	42.6	N/A	-0.005	64723
31	53.4	29.0	43.0	N/A	-0.019	126132
ARITHMETIC MEAN	37.2	29.4	38.2	N/A	-0.005	34883
MAXIMUM	54.3	29.9	43.0	N/A	0.116	126132
MINIMUM	15.4	28.8	35.4	N/A	-0.083	2492
MEDIAN	37.1	29.5	37.5	N/A	-0.008	26770

Notes: * - Limited number of samples in daily average, i.e readings were not recorded, due to power outages or computer problems.
N/A - Humidity sensor data not available
Report generated from previously edited data files.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/
FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT

FACILITY: Fernald Environmental Management Project
U.S. Department of Energy
7400 Willey Road, P.O. Box 398704
Cincinnati, Ohio 45239 Hamilton

K-65 SILO REPORT

LOCATION: Silo # 2 DATE: March 1993

Day	Ambient Temp Deg. F	Ambient Pres In. Hg.	Temperature Head Space Deg. F	Inter. Hum. %	Diff. Pres In. HG	Head Space Radon (pCi/l)
1	26.0	29.5	36.0	N/A	-0.004	83914
2	35.7	29.3	36.3	N/A	-0.005	191012
*3	38.6	28.8	36.4	N/A	-0.005	41189
4	33.2	29.0	37.4	N/A	-0.005	47669
*5	27.8	29.2	37.4	N/A	-0.004	53344
*6	33.7	29.3	37.2	N/A	-0.004	121049
*7	37.4	29.2	37.8	N/A	-0.005	86475
*8	37.1	29.3	38.0	N/A	-0.005	14504
9	37.1	29.5	38.2	N/A	-0.004	128547
10	37.4	29.2	38.5	N/A	-0.005	94906
11	31.0	29.5	38.6	N/A	-0.004	57001
12	28.0	29.6	38.3	N/A	-0.004	69231
13	20.4	29.2	38.0	N/A	-0.005	14578
14	15.4	29.5	37.2	N/A	-0.004	3050
15	26.7	29.7	36.6	N/A	-0.004	3050
16	39.6	29.6	37.2	N/A	-0.006	8891
*17	29.1	29.8	37.8	N/A	-0.005	13314
*18	21.3	29.9	37.2	N/A	-0.005	11530
19	29.2	29.8	37.0	N/A	-0.004	7806
20	36.1	29.7	37.3	N/A	-0.005	23123
*21	36.9	29.7	37.7	N/A	-0.004	128725
22	44.2	29.7	38.2	N/A	-0.005	73022
*23	51.4	29.4	39.1	N/A	-0.036	221182
24	45.8	29.5	39.9	N/A	-0.005	161051
25	47.3	29.6	40.3	N/A	-0.006	22624
26	51.7	29.5	41.0	N/A	-0.007	32351
27	46.6	29.4	41.7	N/A	-0.006	84976
28	48.5	29.3	41.9	N/A	-0.006	54075
29	54.3	29.3	42.4	N/A	-0.007	108370
30	52.1	29.3	42.9	N/A	-0.007	54211
31	53.4	29.0	43.2	N/A	-0.018	149821
ARITHMETIC MEAN	37.2	29.4	38.6	N/A	-0.006	69826
MAXIMUM	54.3	29.9	43.2	N/A	-0.004	221182
MINIMUM	15.4	28.8	36.0	N/A	-0.036	3050
MEDIAN	37.1	29.5	38.0	N/A	-0.005	54211

Notes: * – Limited number of samples in daily average, i.e readings were not recorded, due to power outages or computer problems.
N/A – Humidity sensor data not available
Report generated from previously edited data files.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITIES COMPLIANCE AGREEMENT/
FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT

FACILITY: Fernald Environmental Management Report
U.S. Department of Energy
7400 Willey Road, P.O. Box 398704
Cincinnati, Ohio 45239 Hamilton

SELECTED SAMPLING LOCATION RADON DATA REPORT

MONTH: MARCH, 1993

Monthly Summary of Selected Sampling Locations

Daily Averages

Date	AMS 5 (pCi/L)	AMS 6 (pCi/L)	PLT PLANT (pCi/L)	BKGRD (pCi/L)
03/01/93	0.4 I	0.5 I	0.9	0.5
03/02/93	0.8	0.5	0.7	0.4
03/03/93	0.4	0.5	0.4	0.4
03/04/93	0.4	0.3	0.5	0.3
03/05/93	0.3	0.2	0.3	0.6
03/06/93	0.5	0.4	0.4	0.6
03/07/93	0.5	0.4	0.6	0.3
03/08/93	0.3	0.2	0.3	0.3 I
03/09/93	0.4	0.3	0.3	0.3
03/10/93	0.4	0.3	0.3	0.3
03/11/93	0.3	0.2	0.3	0.3
03/12/93	0.4	0.2	0.3	0.3
03/13/93	0.4	0.3	0.3	0.3
03/14/93	0.6 I	0.4	0.3	0.4
03/15/93	0.5 I	0.5	0.5	0.4
03/16/93	0.4	0.2	0.3	0.2
03/17/93	0.5	0.3	0.3	0.3
03/18/93	0.6	0.4	0.3	0.3
03/19/93	0.5	0.4	0.4	0.3
03/20/93	0.5	0.3	0.4	0.3
03/21/93	0.4	0.3	0.3	0.4
03/22/93	0.6	0.5	0.4	0.3
03/23/93	0.5	0.3	0.3	0.4
03/24/93	0.5	0.3	0.4	0.3
03/25/93	0.4	0.4	0.3	0.3
03/26/93	0.4	0.3	0.3	0.3 I
03/27/93	0.4	0.3	0.3	I
03/28/93	0.4	0.3	0.3	I
03/29/93	0.5	0.3	0.4	I
03/30/93	0.7	0.5	0.4	I
03/31/93	0.6	0.4	0.3	I

	AMS 5 (pCi/L)	AMS 6 (pCi/L)	PLT PLANT (pCi/L)	BKGRD (pCi/L)
AVERAGE	0.7	0.5	0.8	0.5
MAXIMUM	1.5	1.2	1.6	1.3
MINIMUM	0.3	0.3	0.5	0.3
MEDIAN	0.4	0.3	0.3	0.3
Std. Dev	0.4	0.2	0.3	0.2

NOTES: 1. "I" indicates incomplete data due to radon monitor malfunction.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITIES COMPLIANCE AGREEMENT/
FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT

FACILITY: Fernald Environmental Management Report
U.S. Department of Energy
7400 Willey Road, P.O. Box 398704
Cincinnati, Ohio 45239 Hamilton

SELECTED SAMPLING LOCATION RADON DATA REPORT

MONTH: MARCH, 1993

Monthly Summary of Selected Sampling Locations

Daily Averages

Date	K-65, NW (pCi/L)	K-65, SW (pCi/L)	K-65, NE (pCi/L)	K-65, SE (pCi/L)
03/01/93	1.3 I	1.7	7.9	14.8
03/02/93	1.8	3.4	2.5	3.3
03/03/93	0.8	4.3	0.3 I	0.7
03/04/93	0.9	1.2	0.8	0.8
03/05/93	0.8	0.6	0.6	1.2
03/06/93	1.5	1.5	6.6 I	1.5 I
03/07/93	1.2	1.2	I	4.2
03/08/93	1.0	0.8	1.6 I	0.6
03/09/93	0.9	1.5	0.9	0.8
03/10/93	2.8	1.2	6.4	0.8
03/11/93	0.6	0.6	5.6	1.0
03/12/93	0.7	0.7	6.5	1.2
03/13/93	1.0	1.1	2.8 I	0.8
03/14/93	0.9	0.8	I	2.3
03/15/93	1.1	1.3	I	1.1 I
03/16/93	0.6	0.6	0.3 I	0.7
03/17/93	0.7	0.7	0.3	I
03/18/93	0.9	2.5	0.3	0.6
03/19/93	1.8	1.5	0.4	0.7
03/20/93	1.4	1.1	0.8	1.3 I
03/21/93	1.0	1.2	1.2	4.8 I
03/22/93	1.4	3.1	0.9	5.4 I
03/23/93	1.4	0.7	0.6	2.8 I
03/24/93	1.0	1.1	0.8	1.0
03/25/93	0.9	1.9	0.4	0.8
03/26/93	0.7	1.9	0.3	0.6
03/27/93	0.7	0.9	0.3	0.6
03/28/93	0.6	0.8	0.4	0.7
03/29/93	0.9	1.2	1.7	1.4
03/30/93	1.6	2.3	0.9	1.2
03/31/93	1.8	2.6	0.7	0.9

Summary of Daily Averages

	K-65, NW (pCi/L)	K-65, SW (pCi/L)	K-65, NE (pCi/L)	K-65, SE (pCi/L)
AVERAGE	1.9	2.0	2.7	2.0
MAXIMUM	6.8	4.5	8.8	5.5
MINIMUM	0.6	0.7	0.5	0.2
MEDIAN	1.0	1.2	0.8	0.9
Std. Dev	1.3	1.0	2.2	1.2

NOTES: 1. "I" indicates incomplete data due to radon monitor malfunction.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/
FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT

FACILITY: Fernald Environmental Management Project
U.S. Department of Energy
7400 Willey Road, P.O. Box 398704
Cincinnati, Ohio 45239 Hamilton

K-65 SILO REPORT
RADON CONCENTRATIONS

MONTH: MARCH, 1993 REPORT GENERATED: 04/20/93

Daily Summary of Recorded Headspace Concentrations
(recorded at 5 minute intervals)

	SILO 1				SILO 2			
Date	Average	Maximum	Minimum	Std. Dev.	Average	Maximum	Minimum	Std. Dev.
03/01/93	51603	140760	10450	34413	83914	414150	2550	90777
03/02/93	99724	172880	15470	42140	191012	324310	30410	76109
03/03/93	23704	126210	2930	26716	41189	234640	5690	53470
03/04/93	17008	161840	2260	29425	47669	306180	3710	47005
03/05/93	4076	46080	2260	4392	53344	119590	12120	23805
03/06/93	31838	139430	2090	30948	123238	248650	41950	40344
03/07/93	38204	153640	3600	37596	86475	210250	18540	53414
03/08/93	2492	8280	2260	660	14504	29090	7830	3422
03/09/93	26770	113000	2260	30557	128547	300410	19370	86641
03/10/93	58603	173880	2430	61822	94906	269090	9810	77503
03/11/93	7754	96770	2260	12597	57001	189970	15080	41335
03/12/93	15069	89580	3090	14998	69231	158820	15580	30373
03/13/93	6063	63820	2430	6883	14578	41790	3050	11306
03/14/93	6102	23340	2430	6438	3050	3050	3050	0
03/15/93	47284	141270	7950	33861	3050	3050	3050	0
03/16/93	20961	114670	3090	17505	8891	80360	3050	10691
03/17/93	5984	86230	2430	10125	13314	79370	3050	14236
03/18/93	5577	32030	2430	3850	11530	33380	3050	10009
03/19/93	54102	128050	5100	38490	7806	33540	3050	9008
03/20/93	36725	131230	3090	35452	23123	104750	3050	24037
03/21/93	48140	121360	3090	40589	128725	240580	34040	64319
03/22/93	28601	113000	2430	31699	73022	223430	5690	54984
03/23/93	108341	174220	3600	59968	221182	304530	49530	54853
03/24/93	46295	141600	4930	40998	161051	288050	49700	57573
03/25/93	10040	83720	2090	12091	22624	116460	3710	24194
03/26/93	6870	85730	2090	11972	32351	193760	3050	32975
03/27/93	14099	91420	2260	14693	84976	207770	13600	48262
03/28/93	19330	120360	2930	24198	54075	179590	16900	37851
03/29/93	49423	139430	2930	38846	108370	274860	17720	74169
03/30/93	64723	141430	2930	42966	54211	226070	3710	72867
03/31/93	126132	220050	32370	53961	149821	306180	3380	130165

Grab Samples of Headspace

Date	SILO 1 Concentration	SILO 2 Concentration
03/08/93	1031	53226
03/16/93	31267	7727
03/20/93	1790	132969
03/22/93	No Data	4109
03/26/93	No Data	54786

Notes:
1. All values reported in pCi/L.
2. Data reported on 3/3/93 was incomplete due to unit malfunction.
3. Data reported on 3/5/93 – 3/7/93 was incomplete due to sitewide high voltage test.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT FOR CONTROL AND ABATEMENT OF RADON-222 EMISSIONS MONTHLY PROGRESS REPORT

PERIOD ENDING MARCH 31, 1993

ENCLOSURE D

DRILLING/BORING LOGS

RI/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 102.40.03.08	PROJECT NAME: K-1bB Perched Water		
BORING NUMBER: 1891	COORDINATES:		DATE 3/11/93
ELEVATION:	GWL: Depth 1.0 ft	Date/Time 3/12/93 1100	DATE STARTED: 3/11/93
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	DATE COMPLETED: 3/12/93
DRILLING METHODS: Hollow Stem Auger			PAGE 1 OF 3

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0.0 – 1.5	1445 108931 3/11/93	3 7 12	0	No Recovery	NA	NA	
1.5 – 3.0	1450 108931 3/11/93	3 7 12	11	Hard 2.5Y(5/6) Light olive brown clay w/ limestone chunks & organic lo plasticity, dry	Cl	4.0	HNu=0ppm BX=100cpm
3.0 – 4.5	1453 108932 3/11/93	5 8 17	10	Md. Dense 2.5(5/6) Light olive brown midgrained sand, poorly graded, dry	SP	NA	HNu=0ppm BX=100cpm
4.5 – 6.0	1455 108933 3/11/93	6 5 4	14	Loose 2.5(5/6) Light olive brown midgrained sand, poorly graded moist	SP		HNu=0ppm BX=60-80cpm
6.0 – 7.5	1457 108934 3/11/93	3 5 6	15	Md. Dense SAA, wet	SP	NA	HNu=0ppm BX=70cpm
				V. Stiff 2.5Y(5/6) Light olive brown sandy clay, low plasticity, wet	Cl	3.25	
7.5 – 9.0	1500 108935 3/11/93	5 10 15	16	V. Stiff Light olive brown clay low plasticity, moist at the top dry at the bottom	Cl	3.5	HNu=0ppm BX=30cpm
9.0				Boring terminated at 9.0 ft			
10.5							
12.0							
13.5							
15.0							

PRELIMINARY

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier

Driller: Jim Saccani

Dan Jamison

SAA - SAME AS ABOVE

NA - NOT APPLICABLE

Samples collected per ASTM standard penetration test.

Colors identified with Munsell Color Chart.

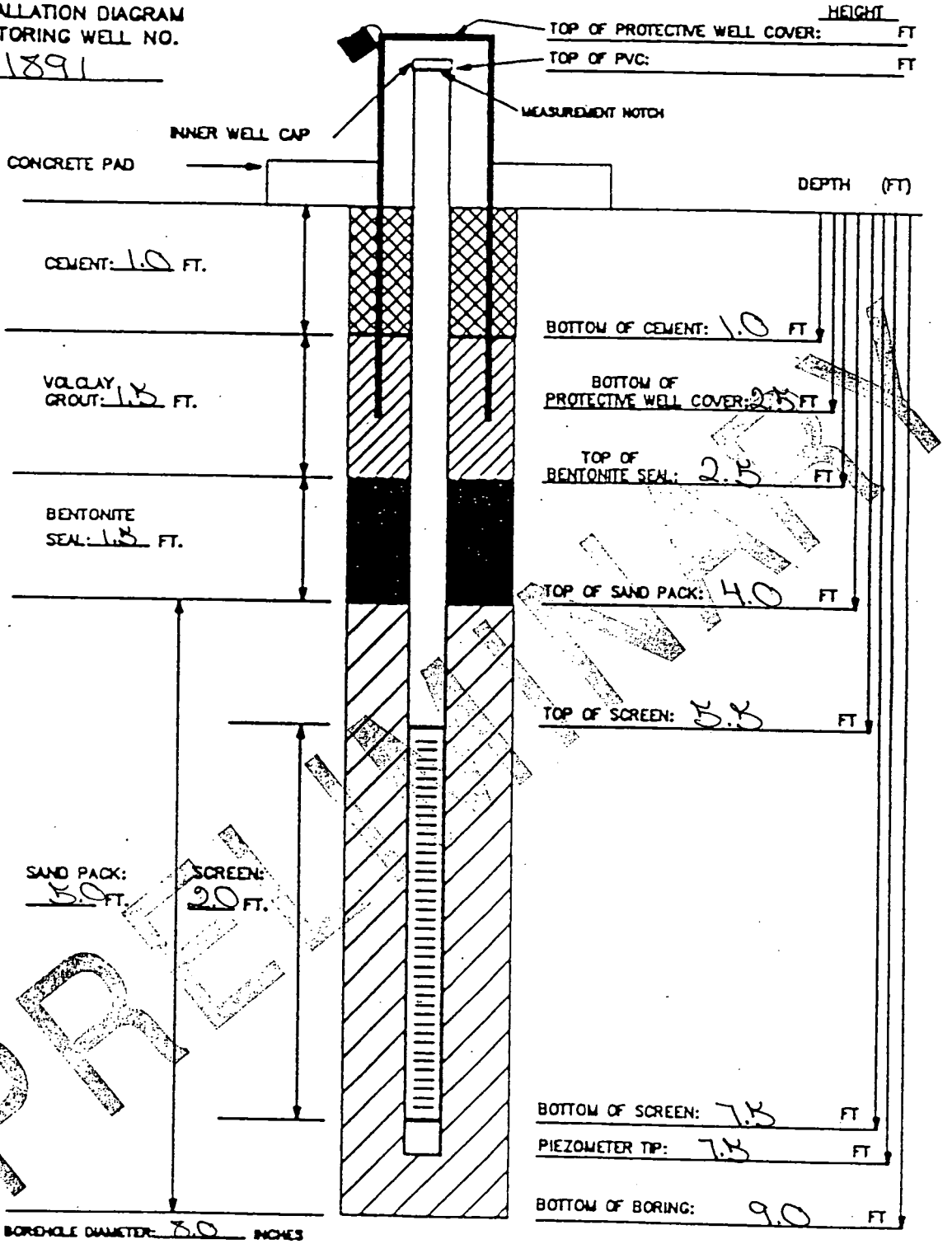
Bkgd: HNu = 0ppm BX = 60-80cpm

402-11-86

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO.
1891

INSTALLATION DATE: 3/12/93



MATERIALS USED:

SAND TYPE AND QUANTITY: 10/20, 3bags
BENTONITE PELLETS (5-GALLON BUCKETS): 1 Bucket
BAGS OF VOLCLAY GROUT: 1/2 bag
AMOUNT OF CEMENT: 1/2 bag
AMOUNT OF WATER USED: 5gallons
OTHER:

NOTES:

1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.
4) WATER DEPTH/DATE:

1 water & 1 soil drum

TASK: 102.4003.05

GEOLOGIST/ENGINEER: D. O'Brien

FERNALD RI/FS

3043

4331

PIEZOMETER INSTALLATION SHEET

PROJECT NAME K-65 Lysimeter — FIELD ENG./GEO. D.O'Brien — DATE 3/12/93
PRCJECT NC. 1152.40.03.05 — CHECKED BY _____ — DATE _____
BORING NO. 1891
PIEZOMETER NO. 1891 — DATE OF INSTALLATION 3/12/93

BOREHOLE DRILLING

DRILLING METHOD Hollow Stem Auger — TYPE OF BIT Auger
DRILLING FLUID (S) USED:
FLUID — FROM — TO —
FLUID — FROM — TO —
CASING SIZE (S) USED:
SIZE NA FROM — TO —
SIZE NA FROM — TO —

PIEZOMETER DESCRIPTION

TYPE Monitoring Piezometer — RISER PIPE MATERIAL Schedule 40 PVC
DIAMETER OF PERFORATED SECTION 2.0 in ID — RISER PIPE DIAMETERS:
PERFORATION TYPE: — O.D. 2 5/16 in — I.D. 2.0 in
SLOTS ☒ HOLES ☐ SCREEN ☐ — LENGTH OF PIPE SECTIONS 1-5.5 ft, 1-2.0 in
AVERAGE SIZE OF PERFORATIONS 0.020 in — JOINING METHOD Flush joint threaded
TOTAL PERFORATED AREA 2.0 ft

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5.0 ft — OTHER PROTECTION Bagged protective cover w/ padlock
PROTECTIVE PIPE O.D. 4 3/8 in

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION ( )	
TOP OF RISER PIPE				
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE				
BOREHOLE FILL MATERIALS:				
Cement GROUT/SLURRY	TOP 0.0	BOTTOM 1.0	TOP	BOTTOM
BENTONITE	TOP 1.0	BOTTOM 2.5	TOP	BOTTOM
SAND	TOP 2.5	BOTTOM 4.0	TOP	BOTTOM
GRAVEL	TOP 4.0	BOTTOM 9.0	TOP	BOTTOM
	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP 5.5	BOTTOM 7.5	TOP	BOTTOM
PIEZOMETER TIP	7.5			
BOTTOM OF BOREHOLE	3/12/93 7.5 9.0			
GWL AFTER INSTALLATION	10.9			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☒
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒

REMARKS _____

087

409-11-86

FERNALD
RI/FS

4331

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 102.40.03.03	PROJECT NAME. K-65 Lysimeter		
BORING NUMBER: 1593	COORDINATES:		DATE 3/16/93
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 3/16/93
ENGINEER/GEOLOGIST. D. O'Brien	Depth	Date/Time	DATE COMPLETED: 3/17/93
DRILLING METHODS Hollow Stem Auger			PAGE 1 OF 3

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6")	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1	1505 108936	3 7 9	2	Soft. 2.5Y(5/6) Light olive brown gravelly clay, low plasticity moist.	CL	.5	HNu = 0 ppm Bt = 40 cpm
2 3		4 6 8	0	No Recovery	NA	NA	~~HNu = 0 ppm~~ ~~Bt = 80 cpm~~ DJO 3/16/93
4	1520 108937	5 11 15	8	V. Stiff. 2.5Y(4/4) Olive brown gravelly clay, low plasticity moist.	CL	2.5	HNu = 0 ppm Bt = 80 cpm
5 6	1525 108938	8 10 8	10	Med. Dense. 2.5Y(6/6) Olive yellow clayey sand fine to medium, well graded, moist	SW	NA	HNu = 0 ppm Bt = 100 cpm
7	1530 108939	9 12 11	10	Loose, 2.5Y(6/6) olive yellow sand, medium grained, poorly graded, wet	SP	NA	HNu = 0 ppm Bt = 100 cpm
8 9	1535 108940	5 12 12	15	Med. Dense 2.5Y(6/6) Olive yellow sand & gravel, poorly graded, wet.	SP	NA	HNu = 0 ppm Bt = 100 cpm
10	1545 108941	12-8 12 12	15	Med. Dense 2.5Y(6/6) Olive yellow med to fine sand, poorly graded, moist to dry. Bottom 4" gray clay, no plasticity dry	SP CL	NA 2.0	HNu = 0 ppm Bt = 120 cpm
		8 11 15	0	No Recovery	NA	NA	
				Boring terminated at 12.0 ft			

NOTES:

SAA - same as above
NA - not applicable

Drilling Contractor Pennsylvania Drilling

Drilling Equipment Acker Gentry

Driller: Jim Seccani
Ian Jamison

Colors identified using Munsell Color Chart
Samples identified per ASTM standard penetration test.

Bkgd: HNu = 0 ppm Bt = 10-80 cpm

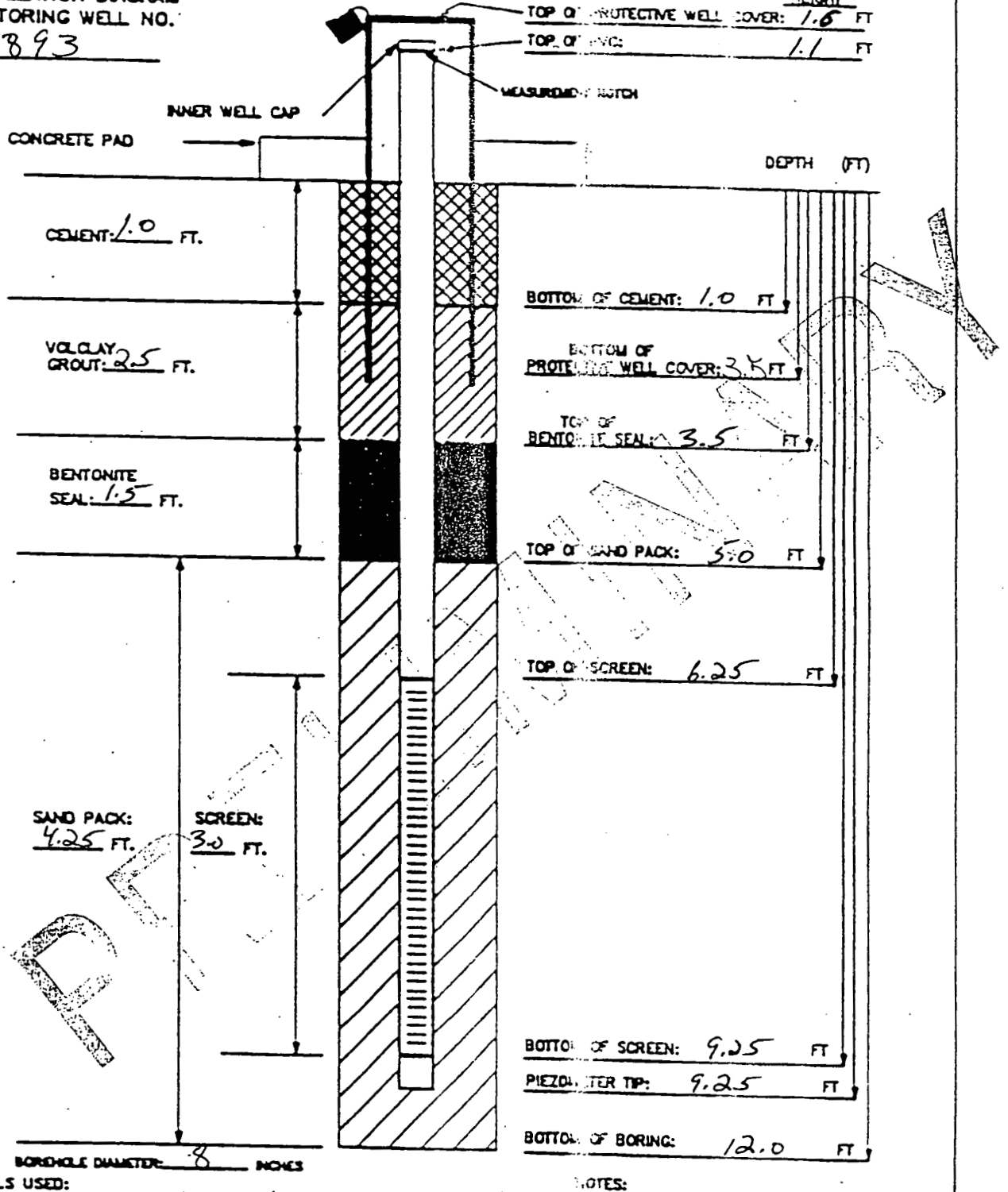
402-11-86

4

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO.
1893

INSTALLATION DATE: 3-17-93



MATERIALS USED:

SAND TYPE AND QUANTITY: 10/20 - 5 bags
BENTONITE PELLETS (5-GALLON BUCKETS): 1 bucket
BAGS OF VOLCLAY GROUT: 1 bag
AMOUNT OF CEMENT: 1 bag
AMOUNT OF WATER USED: 5 gallons
OTHER: No water used during drilling

NOTES:

1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED PLUG.
4) WATER DEPTH/DATE: 9.10FT

TASK: 40.03.05

GEOLOGIST/ENGINEER: T. Anderson

FERNALD
RI/FS

4044 4331

PIEZOMETER INSTALLATION SHEET

PROJECT NAME K-65 Lysimeter | FIELD ENG./GEO. T. Anderson | DATE 3/17/93
PROJECT NO. 40.03.05 | CHECKED BY _____ | DATE _____
BORING NO. 1093
PIEZOMETER NO. 1093 | DATE OF INSTALLATION 3/17/93

BOREHOLE DRILLING

DRILLING METHOD Hollow Stem Auger | TYPE OF BIT Auger
DRILLING FLUID (S) USED: | CASING SIZE (S) USED:
FLUID NA FROM NA TO NA | SIZE NA FROM NA TO NA
FLUID _____ FROM _____ TO _____ | SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE Pneumatic Piezometer | RISER PIPE MATERIAL Stainless Steel PVC
DIAMETER OF PERFORATED SECTION 2 in | RISER PIPE DIAMETERS:
PERFORATION TYPE: | O.D. 2 5/16 in I.D. 2 in
SLOTS ☒ HOLES ☐ SCREEN ☐ | LENGTH OF PIPE SECTIONS 1-5ft, 1-2ft
AVERAGE SIZE OF PERFORATIONS 0.020 in | JOINING METHOD Flush joint threaded
TOTAL PERFORATED AREA 3.0 ft

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5.0 ft | OTHER PROTECTION Steel protective cover with padlock
PROTECTIVE PIPE O.D. 4 in

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION ( )	
TOP OF RISER PIPE	1.1			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	3.5			
BOREHOLE FILL MATERIALS:				
GROUT / SLURRY (Cement)	TOP 0.0	BOTTOM 1.0	TOP	BOTTOM
BENTONITE	TOP 1.0	BOTTOM 3.5	TOP	BOTTOM
SAND	TOP 3.5	BOTTOM 9.25	TOP	BOTTOM
GRAVEL	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP 6.25	BOTTOM 9.25	TOP	BOTTOM
PIEZOMETER TIP	9.25			
BOTTOM OF BOREHOLE	12.0			
GWL AFTER INSTALLATION	9.10			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☒
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS _____

409-11-86

VISUAL CLASSIFICATION OF SOILS

DEO 3/27/93 4

PROJECT NUMBER: 1102.20.03.05	PROJECT NAME: K-65 Investig		
BORING NUMBER: 1392	COORDINATES:	DATE: 3/23/93	
ELEVATION:	GWL: Depth 10.2 Date/Time 3/27/93 1500	DATE STARTED: 3/23/93	
ENGINEER/GEOLOGIST: J.O. Rand	Depth. Date/Time.	DATE COMPLETED: 3/27/93	
DRILLING METHODS: Hollow Stem Auger		PAGE 1 OF 4	

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6")	RECOVERY (")	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1	1521 108942 3/23/93	3 3 3	H	Loose 2.5Y(3/4) Light olive brown clayey sand with gravel, poorly graded moist	SC	NA	HNU = 0ppm BK = 100cpm
2	1529 108943 3/23/93	2 3 4	8	Stiff. 2.5Y(5/4) Light olive brown sandy clay w/gravel, low plasticity moist to wet.	CL	1.25	HNU = 0ppm BK = 80cpm
3	1532 108944 3/23/93	6 9 12	9	V. Stiff 2.5Y(4/1) Dark gray clay w/gravel, no plasticity, dry	CL	2.25	HNU = 0ppm BK = 80cpm
4	1615 108945 3/23/93	7 10 12	8	M. Dense 2.5Y(6/6) Olive yellow fine to medium grained sand well graded moist to wet	SW	NA	HNU = 0ppm BK = 80cpm
5	1633 108946 3/23/93	1 1 1	12	V. Loose 2.5Y(5/3) brown, coarse sand, clayey, well graded, wet	SW	NA	HNU = 0ppm BK = 160cpm
6	1640 108947 3/23/93	2 3 4	15	Loose 2.5Y(5/6) Yellowish brown clayey sand & gravel, well graded, wet	SW	NA	HNU = 0ppm BK = 100cpm
7	1645 108948 3/23/93	3 4 5	18	Loose 2.5Y(5/6) Yellowish brown coarse fining toward the bottom, sand, well graded, wet	SW	NA	HNU = 0ppm BK = 140cpm
8	1653 108949 3/23/93	2 3 5	15	Loose 2.5Y(5/6) Yellowish brown fine sand, poorly graded, moist	SP	NA	HNU = 0ppm BK = 120cpm
9	1701 108950 3/23/93	9 17 18	H	V. Stiff 2.5Y(5/3) brown gravelly clay, no plasticity, dry.	CL	2.25	HNU = 0ppm BK = 100cpm
10	1510 108951 3/24/93	3 4 6	8	Med Stiff. 2.5Y(5/2) grayish brown sandy clay w/gravel, low plasticity, dry	CL	.75	HNU = 0ppm BK = 100cpm

NOTES:

SAA - same as above
NA - Not applicable

Drilling Contractor: Pennsylvania Drilling
Drilling Equipment: Mobile B-61
Driller: Jim Saxon
Jon Jamison

Colors identified using Munsell color chart samples collected using ASTM standard penetration test

RKgd: HNU = 0 ppm BK = 60-70 cpm

402-11-86

RI/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 40.03.05	PROJECT NAME: K-1065 Lysimeter		
BORING NUMBER: 1892	COORDINATES:	DATE 3/26/93	
ELEVATION:	GWL: Depth 10.2 Date/Time 3/27/93 1530	DATE STARTED: 3/23/93	
ENGINEER/GEOLOGIST: D. O'Brien	Depth Date/Time	DATE COMPLETED: 3/27/93	
DRILLING METHODS: Hollow Stem Auger		PAGE 2	OF 4

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
16	1520 108956 3/26/93	3 4 6	16	V. Stiff. 2.5Y(5/1) Gray clay w/gravel, 2in sand lense, low plasticity, moist.	CL	2.5	HNu = 0ppm Bγ = 100cpm
17	1527 108957 3/26/93	5 6 4	15	Loose. 2.5Y(5/1) Gray silty fine sand, poorly graded, wet	SM	NA	HNu = 0ppm Bγ = 80cpm
18 19	1535 108958 3/26/93	1 4 4	18	SAA clayey sand graded to a clay, moist	SM CL	NA 2.0	HNu = 0ppm Bγ = 80cpm
20	1605 108959 3/26/93	4 22 34	18	Hard. 2.5Y(5/1) Gray clay w/ gravel, no plasticity, dry	CL	4.5	HNu = 0ppm Bγ = 80cpm
21				Boring terminated at 21.0 ft			
22							
23							
24							
25							

PRELIMINARY

NOTES:

Drilling Contractor: Professional Drilling

Drilling Equipment: Mobile 70

Driller: Jim Soccoli
Dan Johnson

SAA - same as above
NA - not applicable

402-11-86

4331

FERNALD
RI/FS

WATER QUALITY
FIELD COLLECTION REPORT

Date: 3-24-93
Time: 0947
Page: 1 of 1

FADL REF # B24193

PROJECT NAME	K-65 Lysimeter	SAMPLE LOCATION	MW 1892
PROJECT NUMBER	602.40.03.05	SAMPLE ID NUMBER	1892 B0952
DATE COLLECTED	3/24/93	RFA NUMBER	
TIME COLLECTED	1045	C/C NUMBER	
COLLECTED BY	DOLSC/AC	SAMPLE TYPE	ground water

SAMPLING INFORMATION

BAROMETRIC PRESSURE	29.52 in hg
AIR TEMPERATURE	46°F.
DO SATURATION IN AIR	NA
WATER TEMPERATURE	13.0°C
DEPTH OF SAMPLE	10.0-14.0 ft
WATER LEVEL	8.37 ft

FIELD READINGS

	BEGINNING READ 1	MIDDLE READ 2	END READ 3
pH	7.21	N/A	N/A
SPEC. COND. uMHOS/cm	900	N/A	N/A
D.O. MG/L	N/A	N/A	N/A

	BACKGROUND	BREATHING ZONE	DOWNHOLE READING
HNU	0 ppm	0 ppm	0 ppm

METER CALIBRATION

pH Temp.	pH Std.	pH Std.	D.O. Temp.	D.O. Zero	D.O. Full Sc.	D.O. Calib. O_2	Spec. Cond. Temp.	Spec. Cond. Low	Spec. Cond. High	HNU Stand	HNU Lot #	HNU Span	HNU Reading
17°C	4	7				N/A	17°C	1413	12900	isobutylene		4.2	
OK	—	—	OK	—	/	N/A	OK	1100	10500				

WEATHER CONDITIONS: cloudy

ADDITIONAL REMARKS: BG = 60-80 cpm

TEST EQUIPMENT LIST

EQUIPMENT NUMBER	EQUIPMENT NAME
91C030817	YSI MODEL 33 SCT METER
003689	ORION 250A PH METER
[illegible]	Masterflex model 7518
[illegible]	Hydrolab II

EQUIP.	NUMBER
BAILER	Hydropunch
HOSE/S	
PUMP	
FILTER KIT	Gelman disposable

(T.D. NA) - (W.L. NA) = NA Ht. of Water Column

NA Ht. of Water Column x NA = NA (3 Volumes)

NA Ht. of Water Column x NA = NA (5 Volumes)

0193

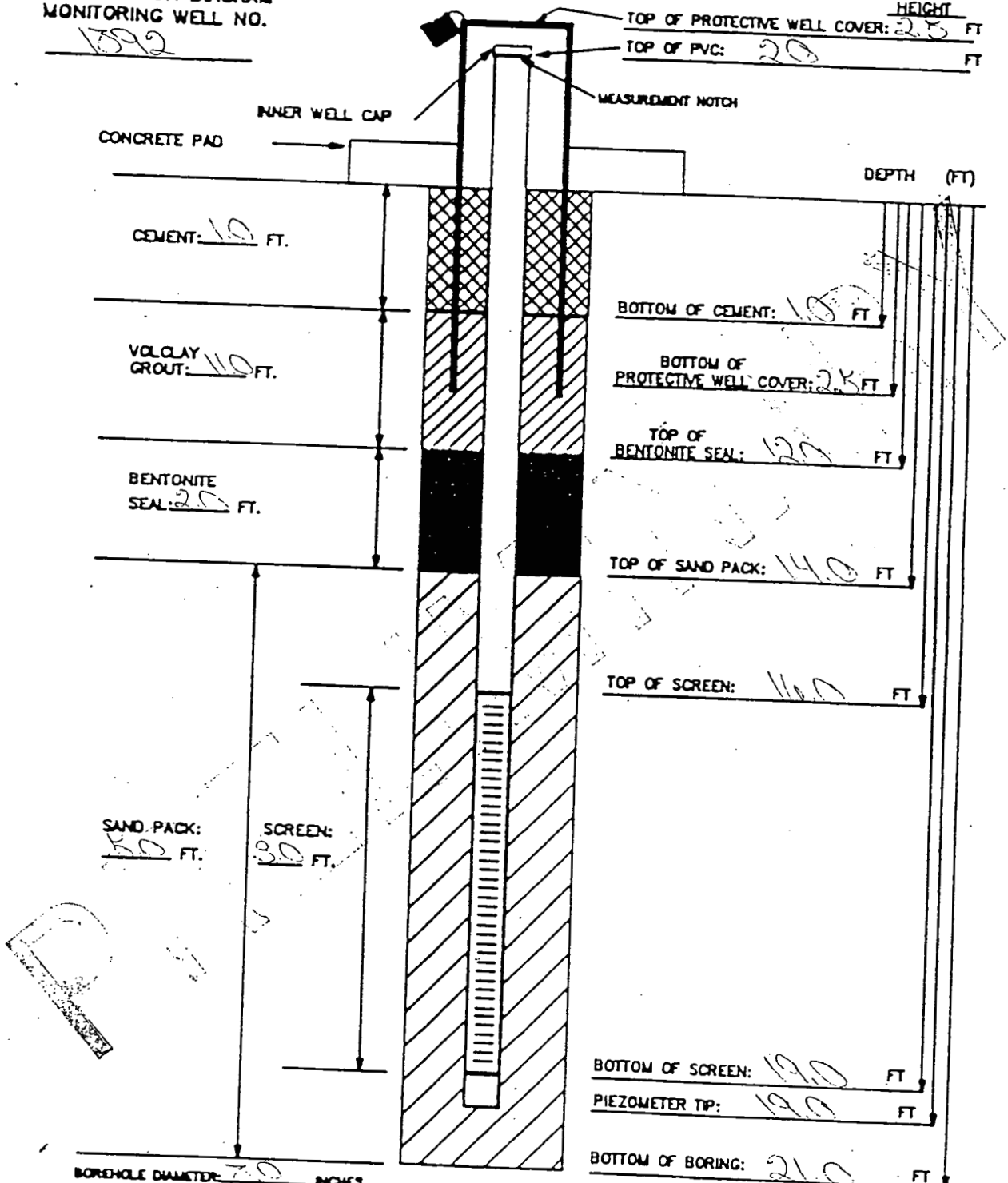
9

ORM 0155D Rev. (1) 9/01/92

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO.
1092

INSTALLATION DATE: 3/2/93



MATERIALS USED:
SAND TYPE AND QUANTITY: #20-30 3 BAGS
BENTONITE PELLETS (5-GALLON BUCKETS): 1 BUCKET
BAGS OF VOLCLAY GROUT: 3 BAGS
AMOUNT OF CEMENT: 1 BAG
AMOUNT OF WATER USED: 30 GALLONS
OTHER: 4 SOIL SAMPLES
1 WATER SAMPLE

NOTES:
1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.
4) WATER DEPTH/DATE: 10.2 3/2/93

TASK: 4003.03

GEOLOGIST/ENGINEER: J. BRAUN

FERNALD
RI/FS

4094

4331

PIEZOMETER INSTALLATION SHEET

PROJECT NAME K-65 Investig | FIELD ENG./GEO. D.O'Brien | DATE 3/27/93
PROJECT NO. 10023.05 | CHECKED BY | DATE
BORING NO. 1392
PIEZOMETER NO. 1392 | DATE OF INSTALLATION 3/27/93

BOREHOLE DRILLING

DRILLING METHOD Hollow Stem Auger	TYPE OF BIT Auger
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID NA FROM NA TO NA	SIZE NA FROM NA TO NA
FLUID ____ FROM ____ TO ____	SIZE ____ FROM ____ TO ____

PIEZOMETER DESCRIPTION

TYPE Vibrating Piezometer	RISER PIPE MATERIAL Schedule 40 PVC
DIAMETER OF PERFORATED SECTION 2.0 in	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. 2 3/8 in I.D. 2.0 in
SLOTS ☒ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS 1-10ft, 1-5ft, 1-3ft
AVERAGE SIZE OF PERFORATIONS 0.010 in	JOINING METHOD Flush joint threaded
TOTAL PERFORATED AREA 3.04	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5.0ft	OTHER PROTECTION Bread protective cover
PROTECTIVE PIPE O.D. 4 3/8 in	with padlock

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION ( )	
TOP OF RISER PIPE	2.0			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	2.5			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 2.0 1.0	BOTTOM 12.0	TOP	BOTTOM
BENTONITE	TOP 12.0	BOTTOM 14.0	TOP	BOTTOM
SAND	TOP 14.0	BOTTOM 19.0	TOP	BOTTOM
GRAVEL	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP 14.0	BOTTOM 19.0	TOP	BOTTOM
PIEZOMETER TIP	19.0			
BOTTOM OF BOREHOLE	21.0			
GWL AFTER INSTALLATION	10.2			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☒
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS

409-11-86
11

Field Form
Page 1 of 1

Sector Number

Well / Boring ID No. 1002

Field Check by _____ Date _____

Subsurface Soil Sample Collection Log

FMPC Facilities Testing Program
Task 40.03.05

Computer Entry	Date	Int.
1st Key		
2nd Key		
ManVer		

Unique Sample Number	Collectors Initials	Collection Date MM DD YY	Collection Time HH MM	Sample Depth Interval	Preservative	Sequence	Blank	Spike	Duplicate	Duplicate of Sample Number	Split	Split of Sample Number	General Comments
10842	[illegible]	03 23 93	12 27	0-1.5		1							
10843			12 29	1.5-3.0		2							
10844			12 32	3.0-4.5		3							
10845			16 16	4.5-6.0		4							
10846			16 35	6.0-7.5		5							
10847			16 40	7.5-9.0		6							
10848			16 43	9.0-10.5		7							
10849			16 58	10.5-12.0		8							
10850	[illegible]	03 23 93	17 01	12.0-13.5		9							
10851	[illegible]	03 24 93	11 15	0.0-1.5		10							
10852	[illegible]		11 15	0.0-1.5		11							
10853				N/A		12							
10854		03 24 93		N/A		13							
10855		03 24 93	15 10	13.5-15.0		14							
10856			15 20	15.0-16.5		15							
10857			15 27	16.5-18.0		16							
10858			15 38	18.0-19.5		17							
10859	[illegible]	03 24 93	16 05	19.5-21.0		18							

960

12

4331

RI/FS

FIELD ACTIVITY DAILY LOG

4331

DAILY LOG NO. NA

SHEET \ OF \

PROJECT NAME: FEMP RI/FS [illegible]

PROJECT NO. 102.10.03.08

FIELD ACTIVITY SUBJECT: Waiting on rig for well 1792

0700	Arrived at Fernald
0710	Monday Morning Meeting
0730	Gave timesheet to D. Hagmel. he said hand it to K. Glenn. R. [illegible] said to wait for drillers. he wasn't sure who would be working
0930	Talked to [illegible], waiting for a Mobile 70 rig because rig [illegible] is too small to turn 14 inch augers
1130	lunch
1230	Rig is here, drillers took Acker rig out of plant. [illegible] has to be inspected and decontaminated before it can go in.
1345	Went in plant. Well 1792 is only 1.5 ft high. Called C. [illegible] and informed her
1545	Came out of plant, talked to C. [illegible] she said to check the well tomorrow to see the height on it
1700	Rig has been steamed + ready to go
1700	left for the day

DO NOT USE

METER CALIBRATION

Hnu Calibration Gas #

Hnu S/N (eV) Span Cal. to ppm

$\beta\gamma$ meter S/N passed cal. check using

α meter S/N passed cal. check using

VISITORS ON SITE:

CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:

WEATHER CONDITIONS: cloudy 35-48°F

IMPORTANT TELEPHONE CALLS:

PERSONNEL ON SITE:

097 13

SUPERVISOR: [illegible]

DATE: 3/22/93

FERNALD
RI/FS

4331

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.30.03.05 (RDC11)	PROJECT NAME: 042 Phase II / South Field	
BORING NUMBER: 11015 (SF-HP-07)	COORDINATES:	DATE: 3-25-93
ELEVATION:	GWL: Depth 4.0 ft Date/Time 3-25-93/1415	DATE STARTED: 3-25-93
ENGINEER/GEOLOGIST: M. Worley	Depth Date/Time	DATE COMPLETED: 3-25-93
DRILLING METHODS: Auger		PAGE 1 OF 3

DEPTH (FT.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
.5	1015 110436 110437 3-25-93 (MW 3-25-93)	4	6	Stiff (2.5Y, 4/2) dark grayish brown clay, trace cobbles and organics medium plasticity, moist	CL	1.0	HNU = 0 ppm Bγ = 100 cpm α = 0 cpm
1.0	1015 110437 110438 3-25-93 (MW 3-25-93)	9	6	Stiff (2.5Y, 4/3) olive brown clay, trace cobbles, low plasticity, moist.	CL	2.0	
1.5	1015 110438 3-25-93	12	2	Stiff (2.5Y, 5/4) light olive brown clay, trace large cobbles, moist, low plasticity	CL	2.0	
2.0	1020 110439 110440 3-25-93 (MW 3-25-93)	18	6	Stiff (2.5Y, 5/4) light olive brown clay, trace gravel, moist, low plasticity.	CL	2.0	HNU = 0 ppm Bγ = 100 cpm α = 0 cpm
2.5	1020 110440 3-25-93	30	6	SAA	CL	2.0	
3.0	1020 N/A 3-25-93	39	0 (MW 3-25-93)	Refusal after 2 attempts. NO RECOVERY	N/A	N/A	
3.5	1040 110441 3-25-93	7	6	Very stiff (2.5Y, 5/6) light olive brown clay, trace gravel, medium plasticity, slightly moist.	CL	2.5	HNU = 0 ppm Bγ = 50 cpm α = 0 cpm
4.0	1040 110442 3-25-93	13	6	SAA	CL	2.5	
4.5	1040 110443 3-25-93	16	6	Stiff, SAA	CL	1.0	
5.0	1060 110444 110445 3-25-93 (MW 3-25-93)	6	6	Stiff (2.5Y, 5/6) light olive brown silty clay, low plasticity, slightly moist.	CL	1.0	HNU = 0 ppm Bγ = 50 cpm α = 0 cpm

NOTES:

Drilling Contractor: Pennsylvania Drilling
Drilling Equipment: Acker Sentry
Driller: Craig Coulter
Helper: Kevin Myers

SAA = Same As Above
N/A = Not Applicable

Background = HNU = 0 ppm, Bγ = 80 cpm, α = 0 cpm

* Samples collected per ASTM Standard Penetration Test.
* All colors identified by the Munsell Color Chart.

402-11-86

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.20.03.05 (RDC11)	PROJECT NAME: OU2 Phase II / South Field	
BORING NUMBER: 11015 (SF-HP-07)	COORDINATES:	DATE: 3-25-93
ELEVATION:	GWL: Depth 4.0 FT Date/Time 3-25-93/1415	DATE STARTED: 3-25-93
ENGINEER/GEOLOGIST: M. Worley	Depth Date/Time	DATE COMPLETED: 3-25-93
DRILLING METHODS: Auger		PAGE 2 OF 3

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
5.5	1050 110445 3-25-93	10	6	Stiff (2.5Y, 5/6) light olive brown silty clay, slightly moist, low plasticity.	Cl	1.0	see page 1
6.0	1050 110446 3-25-93	17	6	SAA	Cl	1.0	
6.5	1100 110447 3-25-93	9	6	Stiff (2.5Y, 5/6) gray mottled light olive brown, silty clay, low plasticity, moist	Cl	1.0	HNU = 0 ppm Bγ = 50 cpm α = 0 cpm
7.0	1100 110448 3-25-93	11	6	SAA	Cl	1.5	
7.5	1100 110449 3-25-93	14	6	Very stiff, SAA	Cl	2.5	
8.0	1330 110450 3-25-93	10	6	Very stiff (2.5Y, 5/4) light olive brown clayey silt, low plasticity, wet.	ML	2.5	HNU = 0 ppm Bγ = 50 cpm α = 0 cpm
8.5	1330 110451 3-25-93	14	6	SAA	ML	2.5	*water bearing zone starts at 7.5 FT.
9.0	1336 110452 3-25-93	19	6	SAA	ML	2.5	*hydro-punch sample collected at 8.0 Ft (# 11065)
9.5	1440 110453 3-26-93	7	6	Stiff (2.5Y, 5/4) Gray mottled light olive brown silty clay, low plasticity, M.W. 3-25-93 moist	Cl	2.0	HNU = 0 ppm Bγ = 60 cpm α = 0 cpm
10.0	1440 110454 3-25-93	12	6	SAA	Cl	2.0	

NOTES:

Drilling Contractor: Pennsylvania Drilling
Drilling Equipment : Acker Sentry
Driller : Craig Coulter
Helper : Kevin Myers

SAA = Same As Above
N/A = Not Applicable

Background = HNU = 0 ppm, Bγ = 30 cpm, α = 0 cpm

* Samples collected per ASTM Standard Penetration Test.
* All colors identified by the Munsell Color Chart.

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.20.03.05 (ROC11)	PROJECT NAME: OU2 Phase II / South Field		
BORING NUMBER: 11015 (SF-HP-07)	COORDINATES:	DATE: 3-25-93	
ELEVATION:	GWL: Depth 4.0 FT Date/Time 3-25-93/1415	DATE STARTED: 3-25-93	
ENGINEER/GEOLOGIST: M. Worley	Depth Date/Time	DATE COMPLETED: 3-25-93	
DRILLING METHODS: Auger		PAGE 3 OF 3	

DEPTH (FT.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10.5	1440 110455 3-25-93	18	3	Stiff (2.5Y, 5/4) Gray mottled light olive brown silty clay, low plasticity, moist	CL M.W. 3-25-93	2.0	See page 2
11.0	1445 110456 3-25-93	18	6	Very stiff (2.5Y, 5/4) Gray mottled light olive brown silty clay, low plasticity, moist	CL	3.5	HNU = 0 ppm Bγ = 50 cpm α = 0 cpm
11.5	1445 110457 3-25-93	26	6	Very stiff (2.5Y, 5/2) grayish brown clayey silt, low plasticity moist.	ML	3.5	
12.0	1445 ~~1445~~ M.W. 3-25-93 110458 3-25-93	32	6	SAA	ML	3.0	
12.5	1545 110459 3-25-93	19	6	Very stiff (2.5Y, 5/3) light olive brown silty clay, ~~to~~ M.W. 3-26-93 medium plasticity, moist	CL	3.0	HNU = 0 ppm Bγ = 50 cpm α = 0 cpm
13.0	1545 110460 3-25-93	24	6	Very stiff (2.5Y, 5/3) light olive brown clay, medium plasticity, moist.	CL	3.0	
13.5	1545 110461 3-25-93	36	6	SAA	CL	3.0	
14.0	1600 110462 3-25-93	16	6	Very stiff (2.5Y, N5/) gray silt, trace fine sand, non-plastic, moist	MH	3.5	HNU = 0 ppm Bγ = 50 cpm α = 0 cpm
14.5	1600 110463 3-25-93	27	6	very stiff (2.5Y, N5/) gray silty fine sand, moist	SM	N/A ~~4.0~~ M.W. 3-25-93	
15.0	1600 110464 3-25-93	38	6	Very stiff (2.5Y, N5/) gray silt, trace fine sand, moist.	MH	4.0	

NOTES:

Drilling Contractor: Pennsylvania Drilling
Drilling Equipment: Acker Sentry
Driller: Craig Coulter
Helper: Kevin Myers

SAA = Same As Above
N/A = Not Applicable

Background = HNU = 0 ppm, Bγ = 80 cpm, α = 0 cpm

* Samples collected per ASTM Standard Penetration Test.
* All colors identified by the Munsell Color Chart.

RI/FS

4331

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 20.03.05	PROJECT NAME: OU2 PHASE 2		
BORING NUMBER: 11014	COORDINATES:		DATE: 3/30/93
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 3/30/93
ENGINEER/GEOLOGIST: D. O'BRIEN	Depth	Date/Time	DATE COMPLETED: 3/30/93
DRILLING METHODS: HOLLOW STEM AUGER			PAGE 1 OF 6

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6")	RECOVERY (")	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0	0935 110468 3/30/93	3	6	V. St. Gy. 2.5Y(5/0) Light olive brown gravelly clay with organics, low plasticity, slightly moist.	Cl	2.25	HNU = 0 ppm BS = 100 cpm
	0935 110469 3/30/93	3	6	SAA	Cl	2.25	HNU = 0 ppm BS = 100 cpm
1	0935 110470 3/30/93	5	6	SAA	Cl	2.5	HNU = 0 ppm BS = 100 cpm
	0945 110471 3/30/93	10	6	SAA, Mod	Cl	4.5	HNU = 0 ppm BS = 100 cpm
2	0945 110472 3/30/93			SAA, V. Stiff	Cl	2.75	HNU = 0 ppm BS = 100 cpm
		24	0	No Recovery	NA	NA	HNU = NA BS = NA

PRELIMINARY

SAA - same as above
NA - not applicable

NOTES:

Drilling Contractor: PENNSYLVANIA DRILLING CO.

Drilling Equipment: ACKER SENTRY

Driller: Craig Cautter, Kevin Myers

Samples collected per ASTM standard penetration test

Colors identified using Munsell Color Chart

Key: HNU = ppm BS = cpm

402-11-86

RI/FS

4331

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 20.03.05	PROJECT NAME. OU2 PHASE 2		
BORING NUMBER: 1014	COORDINATES:		DATE 3/30/93
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 3/30/93
ENGINEER/GEOLOGIST. D. O'BRIEN	Depth	Date/Time	DATE COMPLETED: 3/30/93
DRILLING METHODS: HOLLOW STEM AUGER			PAGE 2 OF 6

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6")	RECOVERY (")	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY @TSF	REMARKS
	0930 10473 3/30/93	4	6	V. Stiff. 2.5Y(5/6) Light olive brown gravelly clay, no plasticity, dry	Cl	2.25	HNU = 0 ppm BS = 100 cpm
	0935 10474 3/30/93	9	4	Stiff. 2.5Y(6/6) Olive yellow gravelly clay; low plasticity moist.	Cl	1.25	HNU = 0 ppm BS = 100 cpm
4		8	0	No Recovery	NA	NA	HNU = NA BS = NA
	1050 10475 3/30/93	4	6	Stiff. 2.5Y(5/6) Light olive brown; clay w/ gravel, low plasticity, dry	Cl	1.25	HNU = 0 ppm BS = 100 cpm
5C	1050 10476 3/30/93	9	6	SAA	Cl	.75	HNU = 0 ppm BS = 100 cpm
	1050 10477 3/30/93	13	3	SAA	Cl	.75	HNU = 0 ppm BS = 100 cpm

NOTES:

SAA - same as above
NA - not applicable

Drilling Contractor PENNSYLVANIA DRILLING CO.

Drilling Equipment ACKER SENTRY

Driller: CHUCK CAULK
KEVIN MYERS

Samples collected per ASTM standard penetration test

Colors identified using Munsell color chart

Key: HNU = 0 ppm BS = 100 cpm

102 402-11-86

18

RI/FS

VISUAL CLASSIFICATION OF SOILS

4331

PROJECT NUMBER: 20.03.05	PROJECT NAME: OU2 PHASE 2	
BORING NUMBER: 11014	COORDINATES:	DATE: 3/30/93
ELEVATION:	GWL: Depth / Date/Time	DATE STARTED: 3/30/93
ENGINEER/GEOLOGIST: D. O'BRIEN	Depth / Date/Time	DATE COMPLETED: 3/30/93
DRILLING METHODS: HOLLOW STEM AUGER		PAGE 3 OF 6

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6")	RECOVERY (")	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	1055 11047 3/30/93	5	6	Stiff. 2.5Y(5/6) Light olive brown clay w/ silt, low plasticity, wet	CL	1.25	HNU = 0 ppm BS = 100 cpm
	1055 11049 3/30/93	6	6	M. Dense. 2.5Y(5/6) Light olive brown clayey silt, wet	ML	NA	HNU = 0 ppm BS = 100 cpm
7	1055 11048 3/30/93	8	6	SAA	ML	NA	HNU = 0 ppm BS = 100 cpm
	1105 11048 3/30/93	13	6	SAA	ML	NA	HNU = 0 ppm BS = 100 cpm
8	1105 11048 3/30/93	13	6	SAA	ML	NA	HNU = 0 ppm BS = 100 cpm
	1105 11048 3/30/93	20	6	Hard. 2.5Y(5/6) Light olive brown mottled w/ gray clay no plasticity, dry	CL	4.0	HNU = 0 ppm BS = 100 cpm

SAA - same as above
NA - not applicable

NOTES:

Drilling Contractor: PENNSYLVANIA DRILLING CO.

Drilling Equipment: ACKER SENTRY

Driller: Craig Carter / Kevin Myers

Samples collected per ASTM standard penetration test

Colors identified using Munsell Color Chart

Key: HNU = ppm BS = cpm

402-11-86

HI/P5

VISUAL CLASSIFICATION OF SOILS

4331

PROJECT NUMBER. 20.03.05	PROJECT NAME. OU2 PHASE 2	
BORING NUMBER: 1104	COORDINATES:	DATE 3/30/93
ELEVATION:	GWL: Depth Date/Time	DATE STARTED 3/30/93
ENGINEER/GEOLOGIST. D. O'BRIEN	Depth Date/Time	DATE COMPLETED: 3/30/93
DRILLING METHODS: HOLLOW STEM AUGER		PAGE 4 OF 6

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6")	RECOVERY (")	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0	1415 110484 3/30/93	3	7	STIFF. 2.5Y(5/6) Light olive brown silty clay with gravel, low plasticity, moist	CL	1.25	HNU = 0 ppm BS = 100 cpm
	1415 110488 3/30/93	9	6	SAA, most today	CL	1.25	HNU = 0 ppm BS = 100 cpm
6	1415 110489 3/30/93	11	6	SAA, dry	CL	1.5	HNU = 0 ppm BS = 100 cpm
				Boring terminated at 10.5ft			HNU = BS =
11							HNU = BS =
							HNU = BS =

NOTES:

SAA - same as above
NA - not applicable

Drilling Contractor PENNSYLVANIA DRILLING CO.

Drilling Equipment ACKER SENTRY

Driller: Craig Cotter
Kevin Myers

Samples collected per ASTM standard penetration test

Colors identified using Munsell color chart

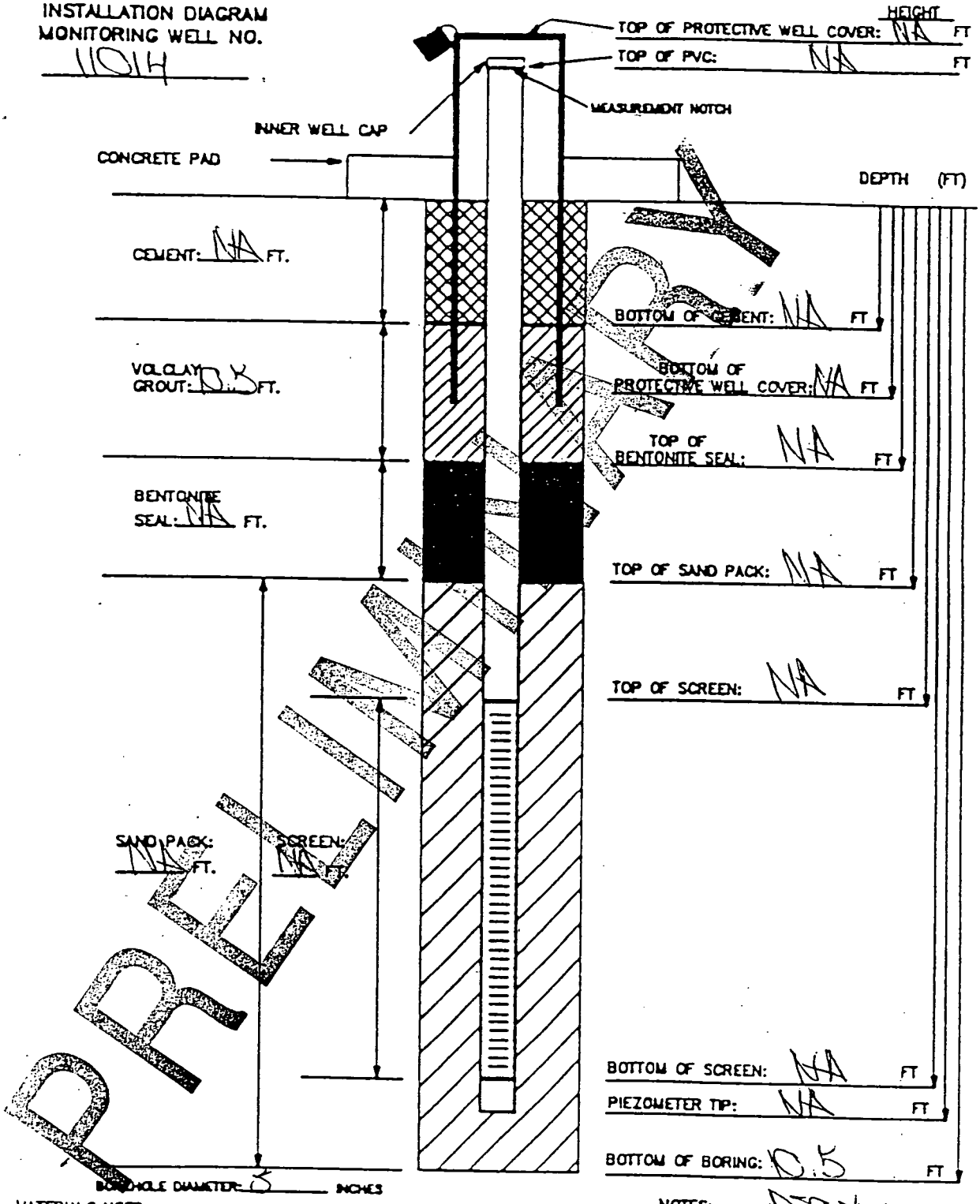
Key: HNU = ppm BS = cpm

402-11-86

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO.
1101H

INSTALLATION DATE: 3/30/93



PRELIMINARY

MATERIALS USED:
SAND TYPE AND QUANTITY: NA
BENTONITE PELLETS (5-GALLON BUCKETS): NA
BAGS OF VOLCLAY GROUT: 2
AMOUNT OF CEMENT: NA
AMOUNT OF WATER USED: 20 gallons
OTHER:
1 soil, 1 water drum TASK: 20.03.05

NOTES: DOS 3/30/93 NA
1) ~~RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.~~
2) ~~SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.~~
3) ~~LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.~~
4) WATER DEPTH/DATE: DS 3/30/93

GEOLOGIST/ENGINEER: D. O'Brien

FERNALD
RI/FS

4331 0046

PIEZOMETER INSTALLATION SHEET

PROJECT NAME OU-2 phase 2 — FIELD ENG./GEO. D.O'Brien — DATE 3/30/93
PRCJECT NC. 20.03.05 — CHECKED BY _____ — DATE _____
BORING NO. 11014
PIEZOMETER NO. _____ — DATE OF INSTALLATION 3/30/93

BOREHOLE DRILLING

DRILLING METHOD Hollow Stem Auger — TYPE OF BIT Auger
DRILLING FLUID (S) USED: — CASING SIZE (S) USED: 8
FLUID NA FROM NA TO NA — SIZE NA FROM NA TO NA
FLUID NA FROM NA TO NA — SIZE NA FROM NA TO NA

PIEZOMETER DESCRIPTION

TYPE boring — RISER PIPE MATERIAL NA
DIAMETER OF PERFORATED SECTION NA — RISER PIPE DIAMETERS:
PERFORATION TYPE: — O.D. NA I.D. NA
SLOTS ☐ HOLES ☐ SCREEN ☐ — LENGTH OF PIPE SECTIONS NA
AVERAGE SIZE OF PERFORATIONS NA — JOINING METHOD NA
TOTAL PERFORATED AREA NA

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA — OTHER PROTECTION NA
PROTECTIVE PIPE O.D. NA

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE ( )		ELEVATION ( )	
TOP OF RISER PIPE	NA			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0.0	BOTTOM 10.5	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP	BOTTOM
SAND	TOP NA	BOTTOM NA	TOP	BOTTOM
GRAVEL	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	DEPTH 10.5			
GWL AFTER INSTALLATION	NA			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☒
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS _____

106 22

409-11-86

4331

FERNALD
RI/FS

WATER QUALITY
FIELD COLLECTION REPORT

Date: 3/30/93
Time: 1400
Page: 1 of 1

FADL REF # 330193

PROJECT NAME	OU-2 Phase 2	SAMPLE LOCATION	1014
PROJECT NUMBER	20.03.05	SAMPLE ID NUMBER	110487
DATE COLLECTED	3/30/93	RFA NUMBER	
TIME COLLECTED	1410	C/C NUMBER	10417
COLLECTED BY	[illegible]	SAMPLE TYPE	ground water

SAMPLING INFORMATION

BAROMETRIC PRESSURE	29.40 in hg
AIR TEMPERATURE	60° F
DO SATURATION IN AIR	NA
WATER TEMPERATURE	13.1° C
DEPTH OF SAMPLE	80-90 ft
WATER LEVEL	55 ft

FIELD READINGS

	BEGINNING READ 1	MIDDLE READ 2	END READ 3
pH	7.04	NA	NA
SPEC. COND. uMHOS/cm	730	NA	NA
D.O. MG/L	NA	NA	NA

	BACKGROUND	BREATHING ZONE	DOWNHOLE READING
HNU	0 ppm	0 ppm	0 ppm

METER CALIBRATION

pH Temp.	pH Std.	pH Std.	D.O. Temp.	D.O. Zero	D.O. Full Sc.	D.O. Calib. O_2	Spec. Cond. Temp.	Spec. Cond. Low	Spec. Cond. High	HNU Stand	HNU Lot #	HNU Span	HNU Reading
16.5°C	4	7				N/A	16.5°C	1413	12900	isobutylene		3.40	0 ppm
OK	—	—	OK			N/A	OK	1200	10500				

WEATHER CONDITIONS: sunny

ADDITIONAL REMARKS: SVE 80-100 cfm

TEST EQUIPMENT LIST

EQUIPMENT NUMBER	EQUIPMENT NAME
889132	Hydrolab II
91030817	YSI Model 33 SCT Meter
0031089	Orion 250A pH meter
889083	Masterflex model 7518

EQUIP.	NUMBER
BAILER	NA
HOSE/S	NA
PUMP	NA
FILTER KIT	synthetic disposable

(T.D. NA) - (W.L. NA) = NA Ht. of Water Column

NA Ht. of Water Column x NA = NA (3 Volumes)

NA Ht. of Water Column x NA = NA (5 Volumes)

107

23

SI FORM 0155D Rev. (1) 9/01/92